SUMMARY OF THE ROCK CREEK PROJECT FINAL EIS

INTRODUCTION

This summary presents a condensed version of information contained in the final Environmental Impact Statement (EIS) for the Rock Creek Project. Sterling Mining Company's proposed action -- the construction and operation of the Rock Creek Project – and four alternatives have been analyzed in this EIS. If interested in more detailed information, one may review the final EIS. The EIS or its summary can be obtained from the following people:

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(406) 444-1760 or (406) 444-4923

A copy of the final EIS can be reviewed at the following locations or via the Internet at the DEQ web page (http://www.deq.state.mt.us/eis.htm) and the USFS web site (http://www.fs.fed.us/r1/Kootenai):

Supervisor's Office, Kootenai National Forest, Libby, MT
Cabinet Ranger Station, Trout Creek, MT
U.S. Forest Service, Regional Office, Missoula, MT
Montana Department of Environmental Quality, Helena, MT
Montana State Library, Helena, MT
U.S. Corps of Engineers, Helena, MT
Mansfield Library, University of Montana, Missoula, MT
Lincoln County Library, Libby, MT
Missoula City-County Library, Missoula, MT
Thompson Falls Library, Thompson Falls, MT
Heron Library, Heron, MT
Noxon High School Library, Noxon, MT
East Bonner County Library, Sandpoint, ID
Clark Fork Library, Clark Fork, ID
Coeur d'Alene Public Library, Coeur d'Alene, ID
Hope Library, Hope, ID

THE EIS AND PERMITTING PROCESS FOR THE ROCK CREEK PROJECT

The Rock Creek Project is a proposed underground copper and silver mine in northwestern Montana. The project is proposed and would be operated by Sterling Mining Company (Sterling). The mine, mill, and other facilities would be located in Sanders County, Montana, near Noxon, Montana (see Figure S-1). Sterling currently holds mineral rights under the Cabinet Mountains Wilderness (CMW). The purpose of the proposed action is to develop the mineral interest. The project would include constructing a mill for ore processing and associated mine waste disposal facilities. A rail loadout for transportation of concentrate, and water treatment facilities would also be built.

Procedures governing the EIS analysis process in Montana are defined in administrative rules implementing the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA). These laws require an EIS to be prepared if any action taken by the State of Montana or the U.S. Forest Service may significantly affect the quality of the human environment (as defined in NEPA and MEPA). The EIS was written to meet the requirements of these statutes and the administrative rules and regulations implementing these laws adopted by participating state or federal agencies.

Two governmental agencies serve as lead agencies for this EIS: Kootenai National Forest (KNF) and Montana Department of Environmental Quality (DEQ). The EIS was prepared in response to applications to operate the Rock Creek Mine submitted to KNF and DEQ. One other agency will use this EIS to make decisions on permits it issues. The U.S. Army Corps of Engineers (COE) will make a determination on Sterling's permit under Section 404 of the Federal Clean Water Act.

The scope of the EIS includes actions, alternatives, and analyses that would be considered in separate EISs required by each agency in order to fulfill its regulatory responsibilities. Preparation of a single EIS for the Rock Creek Project provides a coordinated and comprehensive analysis of potential environmental impacts. The Agencies will make decisions regarding necessary permits or approvals for Sterling to operate the Rock Creek Project. Permitting decisions would be based on the environmental effects and consequences relative to legal standards as documented in this EIS, along with other information presented during agency decision-making processes. In addition, this information would be used to determine the conditions necessary to operate the project, if approved.

PUBLIC INVOLVEMENT

Public participation has been a key element in preparing the EIS (see Table S-1). The first opportunity for public involvement occurred in the beginning of the EIS process when "scoping" was conducted. Scoping is a process designed to identify a broad list of environmental issues related to the proposed action. Scoping was again conducted when preparation of the EIS was resumed after a 4-year lapse. The Agencies separated out significant issues from those identified during the two scoping periods. The subsequent analyses presented in the EIS focus on the identified significant issues.

Meetings and hearings were held for public participation on the draft EIS, supplemental EIS, and the draft MPDES permit. Approximately 3,160 respondents commented on the draft EIS and MPDES permit and 3,300 respondents commented on the supplemental EIS. The agencies continued to receive comments throughout the EIS development process. The Agencies obtained additional information as a result of concerns expressed in these comments.

FIGURE S-1
Location Map
Rock Creek Project
Sanders County, Montana

TABLE S-1
Public Meetings on the Proposed Rock Creek Project

May 26, 1987	Public information meeting held on ASARCO's application in Noxon, Montana
January 27, 1988	Public scoping meeting on ASARCO's application at Noxon, Montana
March 22, 1990	Public meeting on ASARCO's petition to amend ambient water quality at Noxon, Montana
June 16, 1993	Public scoping meeting in Noxon, Montana
June 28, 1993	Public scoping meeting in Sandpoint, Idaho
October 5, 1995 to December 5, 1995	Public comment period on draft EIS
November 14, 1995	Open house and public hearing on draft EIS in Noxon, Montana
November 15, 1995	Open house and public hearing on draft EIS in Sandpoint, Idaho
February 20, 1996 to April 22, 1996	Public comment period on draft MPDES permit and water-quality related portions of draft EIS
April 8, 1996	Public meeting on draft MPDES permit in Noxon, Montana
April 9, 1996	Public hearing on draft MPDES permit in Noxon, Montana
April 10, 1996	Public meeting on draft MPDES permit in Sandpoint, Idaho
April 11, 1996	Public hearing on draft MPDES permit in Sandpoint, Idaho
April 22, 1997	Public town meeting in Sandpoint, Idaho, to discuss new alternatives in supplemental EIS
April 23, 1997	Public town meeting in Noxon, Montana, to discuss new alternatives in supplemental EIS
January 9, 1998 to April 11, 1998	Public comment period on supplemental EIS including a 30-day comment period extension
February 10, 1998	Open house and public hearing on supplemental draft EIS in Missoula, Montana
February 11, 1998	Open house and public hearing on supplemental draft EIS in Sandpoint, Idaho
February 12, 1998	Open house and public hearing on supplemental draft EIS in Noxon, Montana

Public participation does not end if a mine is permitted. The public has the right to appeal the Forest Service decision by filing an appeal as defined in 36 CFR 215. The State of Montana has no public administrative appeals process for this type of permit. The public would need to file law suit against the State in the district court of the first judicial district or in the district court of the county in which the land is located.

The public has the right to review permit files and monitoring reports. If a person believes himself to be adversely affected by the mine or that there is an unreported violation, that person has the right to file a complaint and expect it to be investigated and addressed (ARM 17.24.129). If a mining company files for a major amendment to an existing permit, then active public participation would be sought. Public recourse to these decisions would be as described above.

In an EIS, the Agencies are required to evaluate the environmental effects of the proposed action and reasonable alternatives to it. The Agencies must also consider a no-action alternative. Alternatives other than the proposed action and the no-action alternative were developed by the Agencies in response to identified environmental issues.

ALTERNATIVE DEVELOPMENT

Based on the range of environmental issues identified by the public during scoping and analysis by DEQ and KNF, eight significant issues were identified and drove the development of alternatives and evaluation of impacts:

Issue 1: Effects on quantity and quality of Montana and Idaho surface and ground water resources.

Issue 2: Effects on fish and wildlife and their habitats and current and proposed threatened and endangered species.

Issue 3: Stability of the tailings impoundment/paste facility.

Issue 4: Impacts to socioeconomics of surrounding communities.

Issue 5: Effects on old growth ecosystems.

Issue 6: Effects on wetlands and non-wetland waters of the U.S.

Issue 7: Effects on public access and traffic safety.

Issue 8: Effects on aesthetic quality, including noise, scenic, and wilderness experiences.

A number of alternatives suggested during scoping and public review of the draft and supplemental EISs have been determined by the Agencies to be infeasible or otherwise unreasonable. Dismissed alternatives relative to the EIS fall under the twelve topics listed below:

- other recoverable ore bodies;
- mill and mine portal siting alternatives;
- tailings impoundment siting and construction methods alternatives;
- tailings paste deposition siting alternatives;
- McKay Creek impoundment alternative;
- McKay Creek water retention dam;
- other tailings disposal and transport methods, including backfilling;
- lined tailings disposal facility;
- rail siding (loadout) alternatives;
- combined operations (Rock Creek and Montanore);
- alternate water treatment methods; and
- socioeconomic alternatives.

ALTERNATIVES DISCUSSED IN THE EIS

Five alternatives were carried forward for consideration in the EIS. Table S-2 provides side by side comparison of the main components of the action alternatives. Brief descriptions of the alternatives are provided below:

Alternative I

Under Alternative I, the no-action alternative, the project would be denied or bought out by public agencies. The Rock Creek Mine would not be developed. The no-action alternative provides a baseline for estimating the effects of other alternatives.

Alternative II

Alternative II is Sterling's proposed plan (Figure S-2). Sterling would construct, operate, monitor, and reclaim the Rock Creek Project as proposed in the plan of operation and application as well as its air quality permit application and MPDES permit application. The Agencies would issue the necessary permits and approvals.

Alternative II would disturb 584 acres. Evaluation adit construction would take one year and mine construction and development would take 3 years plus one-half year of limited production. Mine operation would continue for up to 30 years and postmining reclamation would take 2 years. About 59,000 tons of waste rock and 119,000 tons of ore would be excavated from the evaluation adit, and Sterling may decide to run a bulk sample (up to 10,000 short tons) of the ore. The mill would operate 7 days per week, about 354 days per year with a total processing capacity of 3.5 million tons of ore per year. This would generate about 51,000 tons of concentrate per year and a total of 100,000 tons of tailing over the life of the mine. Employment would peak at 433 during mine construction, drop to 92 at the start of mine production and then reach 355 during full mine operation. Other features of Alternative II are briefly itemized below.

- The evaluation adit would be located at the upper end of FDR No. 2741 (Chicago Peak Rd.) with the support facilities located in Section 22. Diesel generators would be used at the evaluation adit and local power lines would supply the support facilities site. Potable water wells would be drilled, sewage would be treated through traditional septic tanks and lateral field or stored in a holding tank, and a temporary water treatment system would be used to treat adit water prior to discharge;

- The mill site would be located in the upper West Fork of Rock Creek, the mine portal and waste rock dump would be upslope from mill site, and access to the portal would be via a new road and above ground conveyor belt;

- The FDR No. 150 and Montana Highway 200 intersection would be located about 1,000 feet east of the Rock Creek bridge on the highway. There would be minor improvements to FDR No. 150 and 2741 above the mill site to the evaluation adit; FDR No 150 would be paved and enlarged to 24 feet wide between mill site and highway with one new bridge and two bridge replacements;

TABLE S-2
Rock Creek Project Alternative Comparison

Project Facility or Feature	Alternative II Proposed Rock Creek Project	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations	Alternative V Paste Facility & Alternative Water Treatment
Mill Site	6.5 miles up FDR No. 150 to upper end West Fork Rock Creek	Same as Alternative II	Confluence of east and west forks of Rock Creek	Same as Alternative IV
Tailings Impoundment	Rock Creek site 325 feet high, 324 acres, upstream construction	Same as Alternative II except modified centerline design w/technical review panel	Same as Alternative III	Same location as Alternative II but utilizing paste
Adit Waste Rock Dump	Southeast of adit 600,000 tons	Above mill site 600,000 tons, some used to create mill site	No separate waste rock dump. 1,000,000 tons used to create mill site and starter berms	Same as Alternative IV
Mine Adits, Length & Grade (to underground crusher)	Up Chicago Peak Rd (FDR No. 2741) 9,000' @+12.7%	Same as Alternative II	At confluence mill site 15,530' @+12%, portal east of FDR No. 150, mill west of FDR No. 150	Similar to Alternative IV, both mine portal and mill west of FDR No. 150.
Mine Adit Access	New gravel road from mill site	FDR No. 150 to FDR No. 2741 1.26 mi. to unnamed spur	FDR No. 150 to mill site. All within mill site boundary. FDR No, 150 underpass to access mine portal except for short spur off of FDR No. 150 for large equipment	FDR No. 150 to mill site. All access from within mill site boundary
Evaluation Adit Length & Grade	Portal near end of FDR No. 2741 6,592' @-10%	Same as Alternative II	Same as Alternative II	Same as Alternative II
Evaluation Adit Waste Rock	178,000 tons, Placed downhill of adit entrance	Same as Alternative II	Same as Alternative II	Same as Alternative II
Evaluation Adit Road, Length & Grade	FDR No. 150 to FDR No. 2741, upgrade FDR No. 2741 for 4.6 mi. & reconst 0.18 mi. spur to 14' wide, gravel	Same as Alternative II	Same as Alternative II plus improve 2.8 miles of FDR No. 150 above confluence mill site	Same as Alternative IV
Evaluation Adit Water Discharge Line	6" polyethylene line approx 8.5 mi. both X-C & along Rd 150, laid on surface for 3 yrs	Same as Alternative II	Same as Alternative II	Same as Alternative II
New Road Construction for Long-term Use	(1) 1.34 mi. new const beginning of FDR No. 150, 24' paved (2) Const 0.88 mi. of 14' graveled road around mill (3) N/A (4) Const 2.33 mi. of 14' graveled road from Sec. 15 to impoundment and const 1.02 of 10' graveled road in Sec. 3 & 10, both along slurry/reclaim lines	(1) 2.16 mi. new const beginning of FDR No. 150, 24' paved (different location than Alternative II) (2) Same as Alternative II except 24' wide (3) Const 0.23 mi. to connect FDR No. 150 to FDR No. 1022, gravel, 14' wide (4) Const 0.61 mi. of 14' gravel road along slurry line, Sec 3 & 10	(1) Same as Alternative III (2) Const 0.04 mi. of 24' paved road into mill site (3) Same as Alternative III (4) N/A	(1) Similar to Alternative III along different alignment for 1.62 miles (2) Same as Alternative IV (3) Same as Alternative III (4) N/A

TABLE S-2
Rock Creek Project Alternative Comparison (Cont'd)

Project Facility or Feature	Alternative II Proposed Rock Creek Project	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations	Alternative V Paste Facility & Alternative Water Treatment
New Road Construction for Long-term Use (Continued)	(5) N/A	(5) 0.08 mi. of 10' road for slurry/reclaim line (Rd150-B to water reclaim pump), gravel	(5) Same as Alternative III	(5) Same as Alternative III
	(6) Const 1.43 mi. of 14' road around S & W of tailings imp for access to dam base and seepage collection line	(6) Const 1.6 mi. of 14' road around S end of tailings imp for access to dam base & rail loadout (paved w/turnouts)	(6) Same as Alternative III	(6) Same as Alternative III
	(7) N/A	(7) Const 0.25 mi.of 14' road to access rail loadout (paved)	(7) Same as Alternative III	(7) Same as Alternative IV
	(8) N/A	(8) Const 0.57 mi.of 10' road - gravel for seepage collection line	(8) N/A	(8) Same as Alternative III plus const. 0.22 mi. - 14' of paved road to paste plant
	(9) Mine Adit Access 1.41 mi. @ 6.5%, 20' wide with 75' ROW, graveled	(9) N/A - see Road Reconstruction	(9) N/A	(9) N/A
	TOTALS: 1.34 mi. paved and 7.07 mi. gravel roads	**TOTALS: 4.01 mi. new paved and 2.29 mi. new gravel roads**	**TOTALS: 4.19 miles paved and 0.25 gravel roads**	**TOTALS: 3.73 miles paved and 0.88 gravel roads**
Road Reconstruction for Long-term Use	(1) FDR No. 150 to mill, widened to 24' & paved for 5.1 mi.	(1) Same as Alternative II, but 4.02 mi., paved	(1) Same as Alternative II except only to confluence mill site, 2.94 mi., paved	(1) Same as Alternative IV but 3.42 mi.
	(2) FDR No. 150B from FDR No. 150 to seepage collection system 0.96 mi. of 14' (gravel)	(2) Improve FDR No. 150-B for 1.7 mi. from Rock Creek crossing to tailings impoundment, widen to 14' slurry line on inside edge of road (paved w/turnouts)	(2) Same as Alternative III	(2) Same as Alternative III including paste plant access 0.76 mi. paved and 1.07 mi. graveled
	(3) Discharge line road to river 0.75 mi. - 10' wide	(3) Same as Alternative II but graveled	(3) Same as Alternative III	(3) Same as Alternative III
	(4) N/A	(4) Reconst. 0.19 mi. of FDR No. 150 from north end of mill site to FDR No. 1741 to 20' wide graveled	(4) Reconst. 0.24 mi. of FDR No. 150 between mill entrance road and portal spur road to 24' wide, graveled	(4) N/A
	TOTALS: 5.1 mi. paved, 0.96 graveled, 0.75 dirt	**TOTALS: 5.72 mi. paved, 2.6 mi. graveled**	**TOTALS: 4.64 mi. paved, 0.99 graveled**	**TOTALS: 4.18 mi. paved, 1.82 graveled**
Slurry and Reclaim Lines	From mill along FDR No. 150 to approx. center Sec. 3, then X-C to impoundment 4.7 mi. (two 10" high pressure urethane-lined steel slurry lines on piers, 1 buried 12' steel reclaim line) 3.3 mi. would be X-C, 1.4 mi. along FDR No. 150	Same as Alternative II to SE of Sec. 15 then continues on FDR No. 150 to SE of Sec. 22 where it follows FDR No. 150-B to impoundment 0.3 mi. X-C in Sec. 10 & 4.9 mi. parallels FDR No. 150	From mill along FDR No. 150 to intersection of old and new FDR No. 150, parallels FDR No.150B to tailings impoundment 3.8 mi.	Same route as Alternative IV but 4 mi. One 16-24" urethaned-lined steel pipeline for slurry, 16" reclaim water pipeline.

TABLE S-2
Rock Creek Project Alternative Comparison (Cont'd)

Project Facility or Feature	Alternative II Proposed Rock Creek Project	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations	Alternative V Paste Facility & Alternative Water Treatment
Excess Mine Adit Water Handling	(1) 12" polyethylene line buried adjacent to road from adit to mill, 6,700' (2) From mill 12" buried line parallels slurry line to Sec. 15, then parallel's FDR No. 150 to MT Hwy 200, then would parallel hwy for 500', would cross and parallel road to Clark Fork for 6.1 mi.	(1) Buried from adit down ridge 3,000' to mill (2) 12" steel excess water line parallels slurry line to intersection of new FDR No. 150, then parallels FDR No. 150 to waste water treatment plant, remainder same as Alternative II, 7.5 mi.	(1) N/A (2) Follows basically the same route as Alternative III except starts at confluence mill site, 6.1 mi.	(1) N/A (2) Basically the same as Alternative IV except 12-14" and goes X-C in Section 33 5.7 mi.
Transmission Line 230 kV Pole Line	Parallels existing 230 kV line from switchyard. Would cross hwy, then parallel newly constructed & reconstructed FDR No. 150 to mill, 5.7 mi.	Starts as in Alternative II, then parallels proposed FDR No. 150 & reconstructed FDR No. 150 to mill 6.6 mi. total length	Same as Alternative III except only goes to confluence mill site 5.2 mi.	Same as Alternative III except near waste water treatment site 5.3 mi.
Conveyor Line	From adit to mill 2,500' by 42" wide	Same as Alternative II	750' long within mill site	Same as Alternative IV
Wilderness Air Intake Ventilation adit	On approx 57% slope, 1,600' NE of ridge @ elev of 5,760'	In the cliffs on approx. 150% slope, 400' NE of ridge @ elev of 6,700'	Same as Alternative III	Same as Alternative III
Rail Loadout Location	At Herford siding	Miller Gulch	Same as Alternative III	Same as Alternative III
Tailings Impoundment Starter Dam Borrow	735,000 cu. yards of borrow from within impoundment & 3 borrow sites (27.2 acres)	Same as Alternative II	735,000 cu. yards of borrow from within impoundment, waste rock from adit construction and borrow site 3 (27.2 acres)	Borrow from within impoundment and utilize waste rock from adit construction
Ore Concentrate Transport Method	Ore concentrate trucked to Herford Siding	Ore concentrate trucked to Miller Gulch rail loadout	Same as Alternative III	Ore concentrate slurried in buried pipeline to Miller Gulch rail loadout via 3" dual wall pipe with leak detection
Soil Storage (1) Evaluation Adit (2) Support Facilities (3) Tailings Impoundment and associated components	 (1) North end; 1.2 ac; 8,757 cy (2) Adjacent storage; 1.3 ac; 4,193 cy (3) Impoundment, borrow areas, pump station S-1 paralled to powerline; 11.3 ac; 248,086 cy S-2 northeast corner near borrow site B-2; 8.3 ac; 179,649 cy Roads (access, haul); adjacent storage; 5.4 ac; 9,290 cy Water control structures; adjacent storage; 9.2 ac; 17,141 cy	 (1) Same as Alternative II (2) Same as Alternative II (3) Similar to Alternative II but stockpiles S-1 and S-2 expanded to handle additional volume: S-1 increases to 19 ac; 563,227 cy S-2 increases to 17.7 ac; 549,598 cy Roads 9,290 cy Water control structures 17,141 cy	 (1) Same as Alternative II (2) Same as Alternative II (3) Same as Alternative III	 (1) Same as Alternative II (2) Same as Alternative II (3) Same as Alternative III but soil stockpiles reduced to 18 ac. because soil would be salvaged incrementally and replaced concurrently, other sites available if needed.

TABLE S-2
Rock Creek Project Alternative Comparison (Cont'd)

Project Facility or Feature	Alternative II Proposed Rock Creek Project	Alternative III Proposed Project w/Mitigations	Alternative IV Modified Project w/Mitigations	Alternative V Paste Facility & Alternative Water Treatment
(4) Transportation Corridor	(4) Stored adjacent to each component; total 29.3 ac; 56,371 cy	(4) Soil stored adjacent to each component only when salvage showed clear benefit to revegetation and would not result in excessive disturbance	(4) Same as Alternative III	(4) Same as Alternative III
(5) Water Treatment Facility	(5) Adjacent storage; 10.0 ac; 32,269 cy	(5) Same as Alternative II	(5) Same as Alternative II	(5) Same as Alternative III
(6) Mill Facilities	(6) S-3 south end; 2.5 ac; 42,271 cy S-4 north end; 3.4 ac; 56,910 cy adjacent storage 1,010 cy	(6) Similar to Alternative II but stockpiles S-3 and S-4 expanded to handle additional volume: S-3 increases to 78,921 cy S-4 increases to 93,560 cy	(6) New location at confluences mill site: north-center; 4.1 ac; 151,665 cy	(6) Same as Alternative IV
(7) Mine	(7) Top soil storage; S-5, 1.5 acres	(7) Similar to Alternative II but soil stored along toe/sides of 2 small waste rock dumps; 9,681 cy	(7) Included in mill facilities (6) above	(7) Same as Alternative IV
	Total cubic yards: 655,949	**Total cubic yards: 1,423,010**	**Total cubic yards: 1,392,513**	**Total cubic yards: 1,392,573**
Mine Adit Water Treatment	Clarification filtration with a passive biotreatment and ion exchange system	Same as Alternative II	Same as Alternative II	Clarification, filtration, nitrification, denitrification (anoxic biotreatment and/or reverse osmosis), aerated pond with settling system.
Evaluation Adit Water Treatment	Pressure filtration, oil skimmer, and a passive biotreatment and ion exchange system	Same as Alternative II	Same as Alternative II	Pressure filtration, oil skimmer, and a reverse osmosis with a pilot anoxic biotreatment system.

Notes: X-C means cross country; N/A means not applicable; ROW means right-of-way; cy means cubic yards.

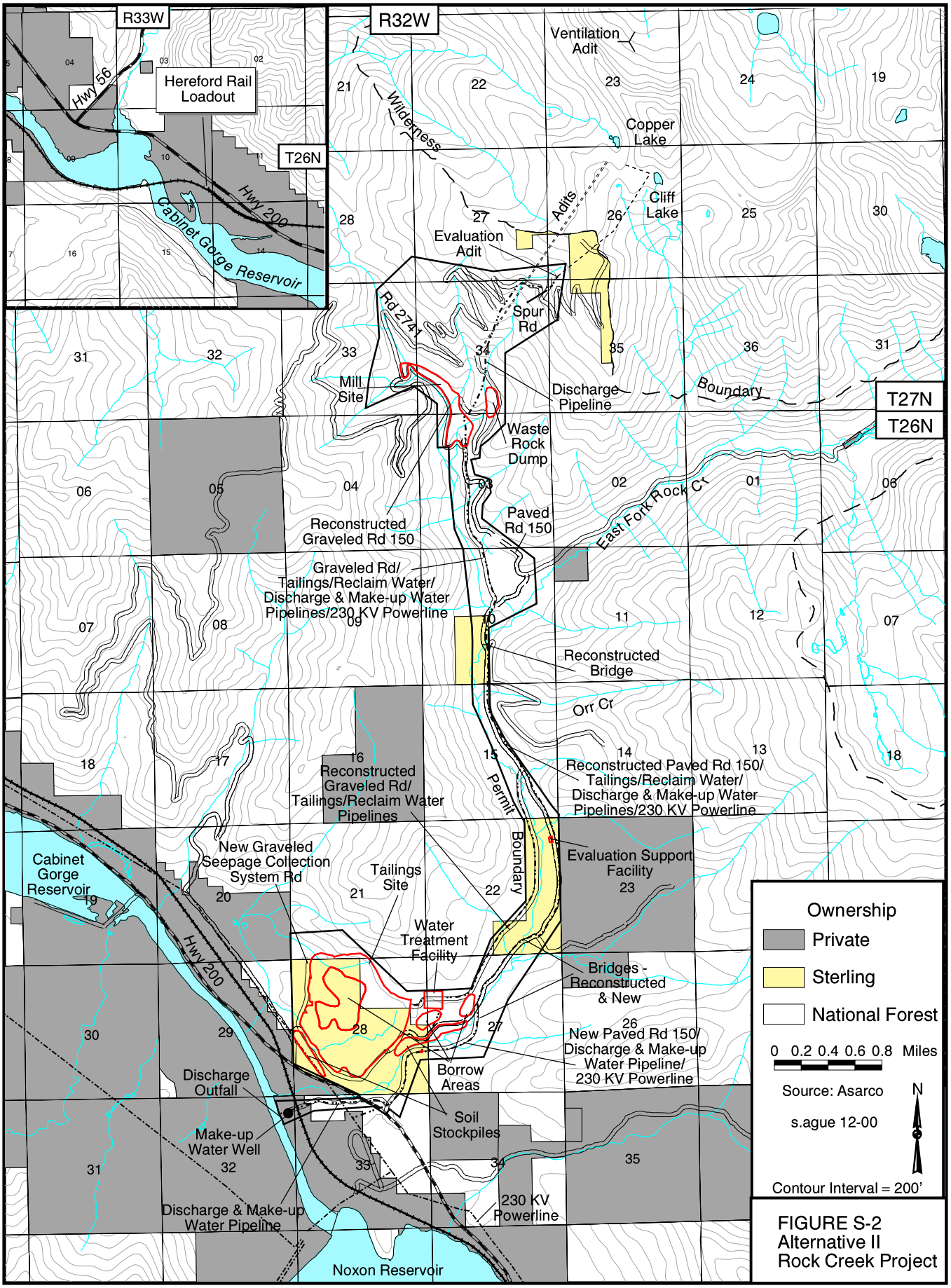


FIGURE S-2
Alternative II
Rock Creek Project

- Utility corridor would parallel FDR No. 150 except in Sections 3 and 10. Twin 10-inch urethane lined, steel pipelines for tailings would be above ground. The 12-inch steel water pipelines would be buried. All pipelines encased in larger pipe at stream crossings. A new 240-kV powerline would be constructed to the mill site along with 2 new substations;

- The unlined impoundment would be constructed as an upslope impoundment. Trench drains, and ground water capture wells would be used to intercept and capture tailings seepage;

- Ore concentrate trucked to new rail loadout facility at Hereford, Montana;

- The mill would use 3,131 gpm of process water during full operation. Water would come from mine, makeup well water, waste water from sewage treatment, mill site runoff, thickener overflow, and reclaimed water from impoundment. Makeup water well would be located in the Clark Fork alluvium near confluence of Rock Creek and river;

- Mine water would be treated via settling sumps in mine, filters and oil skimmers, and a passive biotreatment system and backup ion-exchange system prior to discharge in accordance with MPDES permit limits;

- Mine discharge to the Clark Fork River would range from less than 500 gpm during evaluation adit and mine adit construction, to 570 gpm at year 5, to 740 gpm at year 10, to about 1500 gpm in year 20, and to 2,300 gpm at year 30 and end of mine life;

- Wind and water erosion control measures would be implemented to control fugitive dust, reduce erosion potential, enhance soil stability, and provide stabilizing vegetative cover;

- Numerous measures would be implemented to control runoff and sedimentation;

- Mine adit closure was not specified, but evaluation adit and air-intake ventilation adit would be plugged with cement bulkheads;

- Soil would be salvaged in double lifts at evaluation adit and replaced at 12-13 inches with some rock areas left as talus for a mosaic appearance;

- 24 inches of soil would be salvaged in a single lift at mill site, impoundment area, and wastewater treatment facility site with average replacement of 9.5 inches on the impoundment, 11.4 inches at the mill site, 14.3 inches along transportation corridor, and 24 inches at water treatment site.

- The seed mixes include native and introduced species including annual cereal grain for rapid initial stabilization. No trees or shrubs would be planted at the evaluation adit. Trees would be planted on the impoundment face at mine closure during final reclamation;

- Air quality monitoring would be done in accordance with an air quality permit;

- Soil and erosion control monitoring would involve inspections for erosion in spring and fall and testing of soil, tailings and waste rock;

- Revegetation monitoring would field check vegetation first season after planting and remedial action would be taken if problem areas were identified. Vegetation would be protected for 2 years where necessary. A noxious weed control plan would be developed;

- A fish and wildlife mitigation plan would include posting of fishing, hunting, trapping and recreation regulations, prohibition of firearms or hunting within Sterling property, minimizing vehicular disturbance, cooperating with regulating agencies regarding wildlife issues, and maintaining access to public lands adjoining the project area;

- The threatened and endangered species mitigation plan would also include constructing powerlines to reduce potential for electrocution of bald eagles, developing and implementing a grizzly bear management program with state and federal agencies, and not using clover in the seed mix on disturbed areas during active mine operation;

- The water monitoring plan would include baseline, operational and post operational monitoring of surface and ground water resources. Plans would be subject to review and approval by DEQ;

- Rock mechanics monitoring would incorporate experience from the Troy Mine and field observations adapted to rock mechanics theories and practices for designing the mine;

- A construction and operation monitoring plan for the tailings impoundment and slurry line would provide quality control in four phases: final design, preproduction construction, operation, and interim facility shutdown;

- Sterling would have to comply with the requirements of the approved Hard Rock Impact Plan; and

- Sterling would create 12.3 acres of wetlands to mitigate for the loss of 8.1 acres of wetlands and 1.5 acres of non-wetland waters of the U.S. to compensate for the loss of 1.5 acres of non-wetland waters of the U.S.;

Alternative III

Alternative III consists of Agency-initiated modifications to Sterling's mine proposal (Figure S-3). The changes include modifications to some facility locations and impoundment construction as well as mitigations proposed by the lead agencies to reduce or eliminate undesirable environmental impacts and increases the surface disturbance to 609 acres (see Figure S-3). These mitigations are in addition to or instead of mitigations proposed by ASARCO. This alternative reduces or eliminates adverse impacts associated with all of the identified significant issues except socioeconomics.

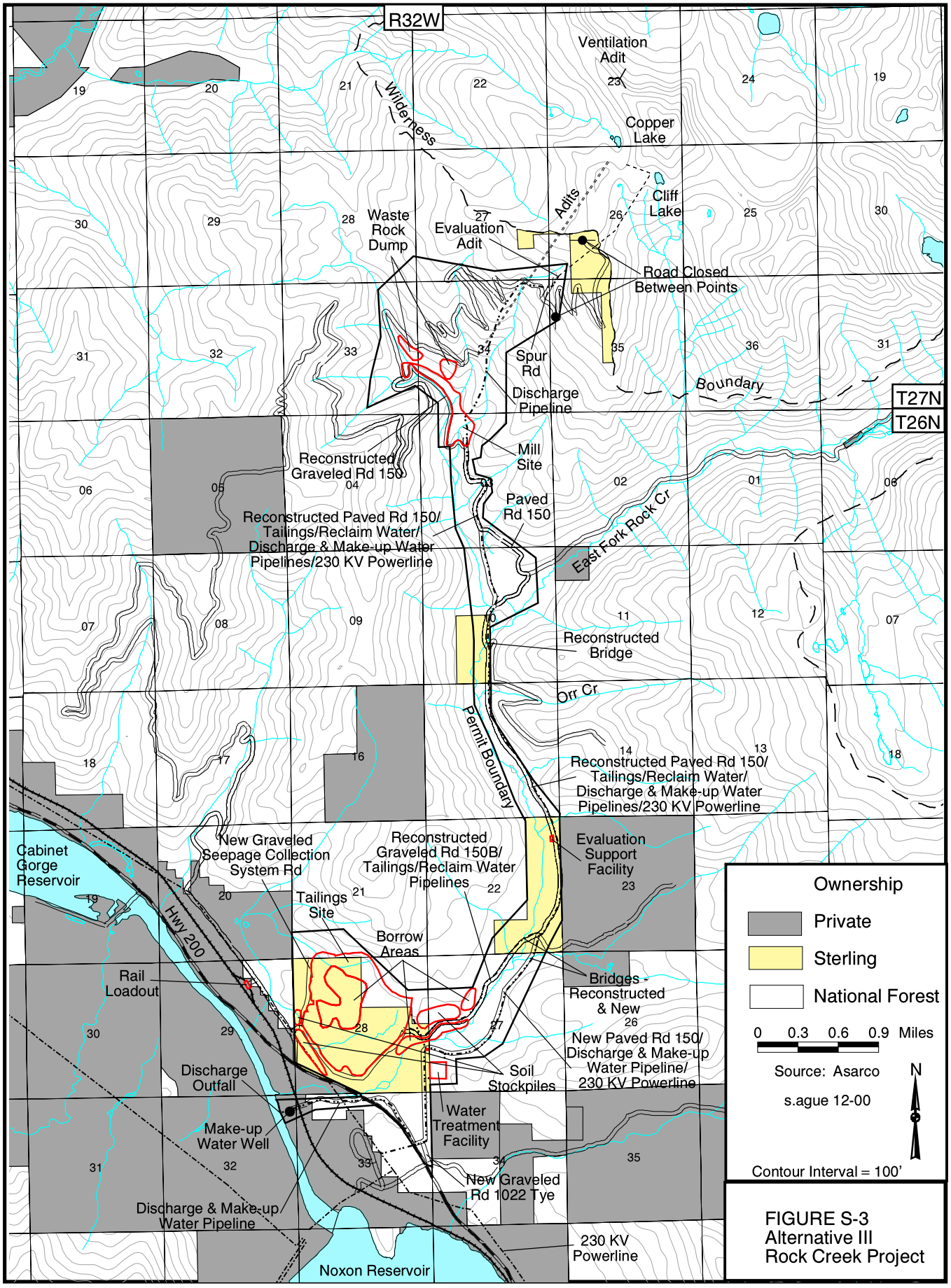


FIGURE S-3
Alternative III
Rock Creek Project

Modifications in Alternative III include:

- a different design for the tailings impoundment dam (modified centerline);
- relocation of the intersection of Rock Creek Road (FDR No. 150) and Montana Highway 200;
- alternate location of the rail siding to Miller Gulch;
- alternate location of the wilderness air-intake ventilation adit;
- modified mine portal access;
- rerouting and combining the utility and road corridors (primarily FDR No. 150) (includes two new bridges, one reconstructed bridge, an extended culvert, and paving of most mine-operation-related roads); and
- relocating the water treatment facility away from proposed major wetland mitigation sites.

Mitigations include:

- technical panel review of final tailings impoundment design;
- starter dams constructed with mine waste rock;
- sealing more permeable areas within tailings impoundment footprint with excavated clays;
- pursuing all reasonable options to an air-intake ventilation adit in the CMW prior to construction;
- visual mitigations for the mill site, the utility corridor, tailings impoundment; ventilation and evaluation adits; developing a transportation management plan;
- more detailed adit closure plan;
- changes in reclamation/revegetation plans, a new vegetation removal and disposition plan, and an expanded vegetation management plan;
- more specific soil salvage, handling, and replacement plan including deeper soil salvage (24 to 36 inches) and replacement depths (average of 24 inches) and salvage of rocky soils;
- measures to reduce noise levels at the mill site and air-intake ventilation adit;
- implementing additional grizzly bear mitigations;
- developing an aquatics/fisheries mitigation plan;
- maintenance of the waste water treatment system and possible long-term post-closure waste water treatment;
- expanded monitoring for hydrology, soil and revegetation, fisheries/aquatics, and wildlife, including increased operational and post operational monitoring;
- more detailed long-term reclamation monitoring plan than Alternative II;
- subsidence control and monitoring plan;
- rock mechanics and hydrogeologic sampling, testing and monitoring program to include geochemical sampling and an acid-base testing program;
- a comprehensive, long-term water monitoring plan which includes monitoring lake levels at Cliff and Copper lakes to be coordinated with subsidence control and monitoring plan and fisheries/aquatics monitoring plan;
- an alert level and contingency/corrective action plan for each monitoring plan;
- cultural resources monitoring during land disturbing activities, and

- Sediment Reduction Plan requiring mitigation of sediment sources on 130 acres within the Rock Creek watershed (also in Alternative V).

Alternative IV

Alternative IV includes the modifications and mitigations proposed for Alternative III as well as an alternate mill/mine adit site. The relocation of the mill/mine adit site reduces the surface disturbance to 542 acres (see Figure S-4). The mine construction and development period would be increased to 3.25 years. This alternative further reduces or eliminates adverse impacts associated with all eight significant issues.

Additional modifications include:

- relocating mine adits and mill site, subsequently reducing utility and road corridor length.

Additional mitigations due to the mill site relocation include:

- site-specific changes in the reclamation/revegetation plan to mitigate visual impacts;
- a 300-foot stream buffer along the mill site;
- a 100-foot visual buffer between the mill site and FDR No. 150; and
- changes to grizzly bear mitigation (replacement acreage changes).

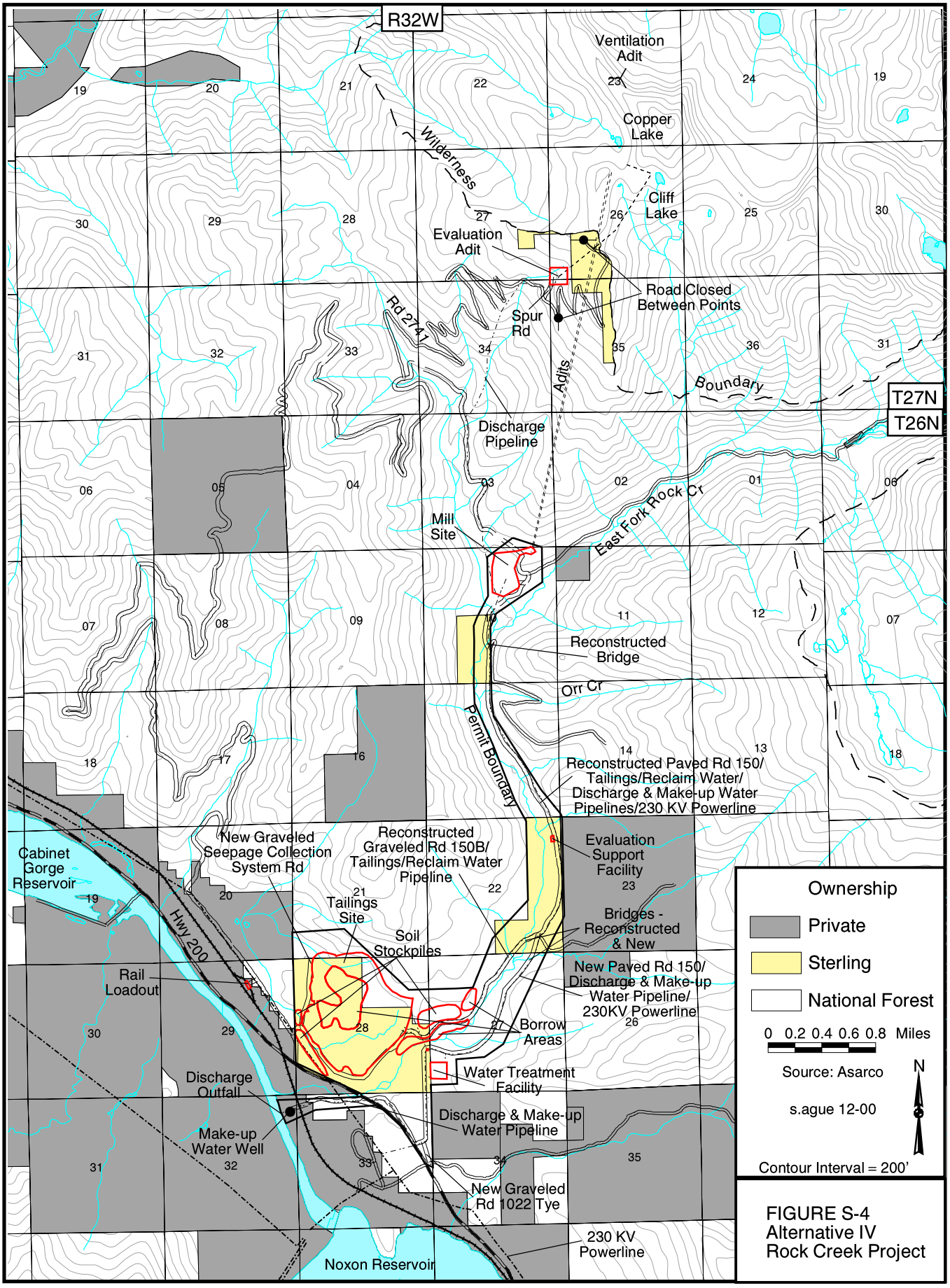
Alternative V

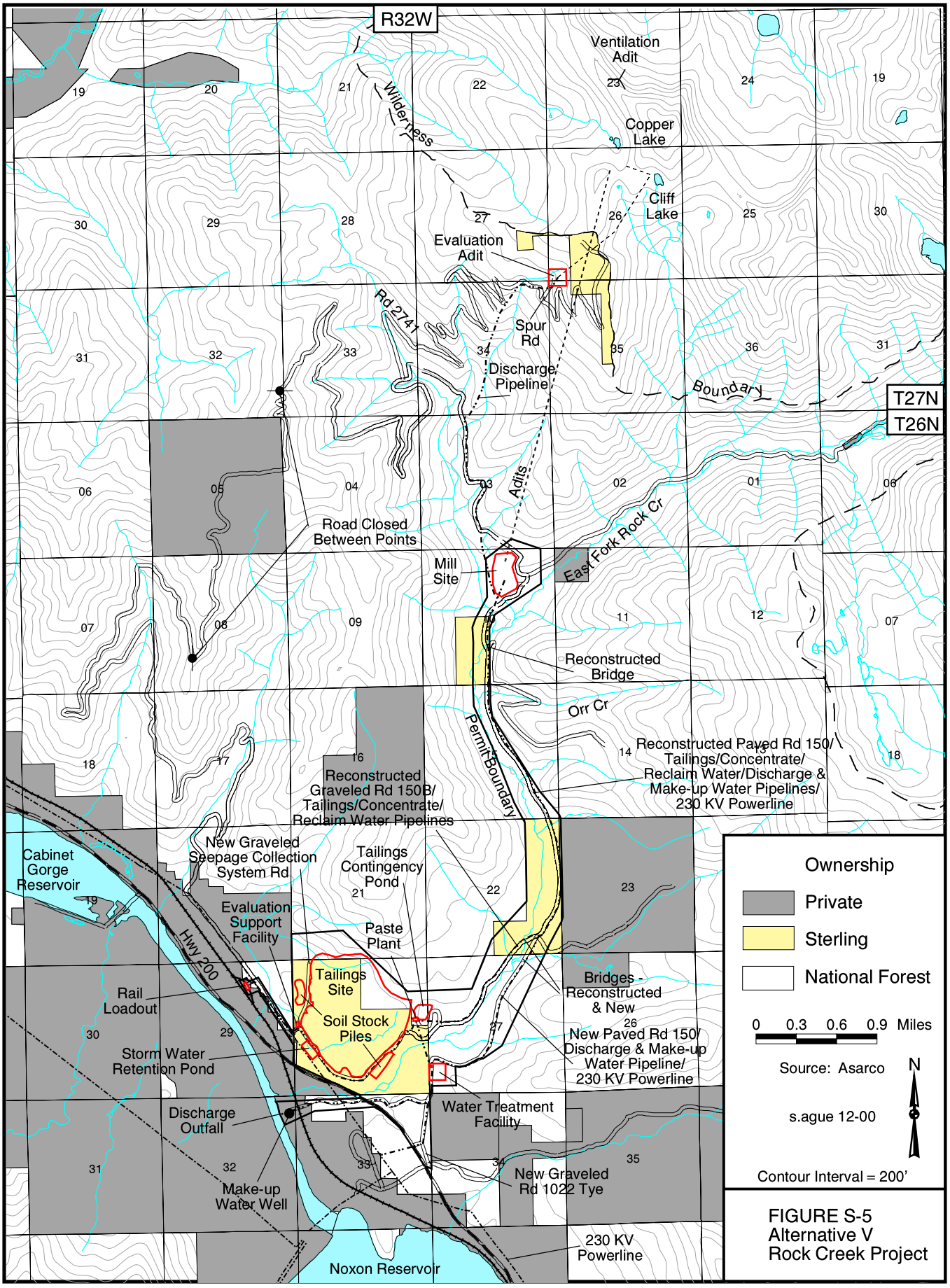
Alternative V includes most of the mitigation and modifications from Alternative III and those from Alternative IV relating to the relocation of the mill site (Figure S-5). Additional modifications include deposition of tailings as a paste rather than as a slurry, modification of the water treatment system to include semi-passive biotreatment and reverse osmosis system, transporting ore concentrate from mill to rail loadout in a pipeline, enclosure of the rail loadout facility and use of covered railcars, and relocation of the evaluation adit support facilities site away from Rock Creek. This alternative reduces or eliminates adverse impacts associated with all eight significant issues.

- a more detailed aquatics/fisheries, wildlife, threatened and endangered species monitoring and mitigation plans than under Alternative II, including a sediment source reduction plan (see Alternative III);
- a comprehensive, long-term water monitoring plan which includes monitoring lake levels, and water budget at Cliff and Copper lakes to be coordinated with subsidence control and monitoring plan and fisheries/aquatics monitoring plans (Alternative III);
- an alert level and contingency/corrective action plan for each monitoring plan (Alternative III); and
- revisions to Sterling's wetlands mitigation and monitoring plans (Alternative III).

Additional modifications incorporated in Alternative V include:

- deposition of tailings as a paste rather than as a slurry to reduce seepage to ground water, mitigate visual impacts, enhance site reclamation, and enhance stability;


R32W
Ventilation Adit
Copper Lake
Wilderness
Cliff Lake
Evaluation Adit
Road Closed Between Points
Spur Rd
Rd 2741
Adits
Boundary
T27N
T26N
Discharge Pipeline
Mill Site
East Fork Rock Cr
Reconstructed Bridge
Orr Cr
Permit Boundary
Reconstructed Paved Rd 150/ Tailings/Reclaim Water/ Discharge & Make-up Water Pipelines/230 KV Powerline
Evaluation Support Facility
Reconstructed Graveled Rd 150B/ Tailings/Reclaim Water Pipeline
New Graveled Seepage Collection System Rd
Cabinet Gorge Reservoir
Hwy 200
Tailings Site
Soil Stockpiles
Bridges - Reconstructed & New
Rail Loadout
New Paved Rd 150/ Discharge & Make-up Water Pipeline/ 230KV Powerline
Borrow Areas
Water Treatment Facility
Discharge Outfall
Discharge & Make-up Water Pipeline
Make-up Water Well
New Graveled Rd 1022 Tye
230 KV Powerline
Noxon Reservoir
Ownership
Private
Sterling
National Forest
0 0.2 0.4 0.6 0.8 Miles
Source: Asarco
s.ague 12-00
N
Contour Interval = 200'
FIGURE S-4
Alternative IV
Rock Creek Project


R32W
Ventilation Adit
Wilderness
Copper Lake
Cliff Lake
Evaluation Adit
Rd 2741
Spur Rd
Discharge Pipeline
Boundary
T27N
T26N
Adits
East Fork Rock Cr
Road Closed Between Points
Mill Site
Reconstructed Bridge
Orr Cr
Permit Boundary
Reconstructed Paved Rd 150/ Tailings/Concentrate/ Reclaim Water/Discharge & Make-up Water Pipelines/ 230 KV Powerline
Reconstructed Graveled Rd 150B/ Tailings/Concentrate/ Reclaim Water Pipelines
Cabinet Gorge Reservoir
New Graveled Seepage Collection System Rd
Tailings Contingency Pond
Evaluation Support Facility
Paste Plant
Hwy 200
Tailings Site
Soil Stock Piles
Rail Loadout
Storm Water Retention Pond
Discharge Outfall
Make-up Water Well
Noxon Reservoir
Water Treatment Facility
Bridges - Reconstructed & New
New Paved Rd 150/ Discharge & Make-up Water Pipeline/ 230 KV Powerline
New Graveled Rd 1022 Tye
230 KV Powerline
Ownership
Private
Sterling
National Forest
0 0.3 0.6 0.9 Miles
Source: Asarco
s.ague 12-00
N
Contour Interval = 200'
FIGURE S-5
Alternative V
Rock Creek Project

- enclosure of the rail loadout facility and use of covered railcars to minimize ground contamination and blowing of concentrate at the site and en route to smelter;
- relocation of the evaluation adit support facilities site away from Rock Creek; and
- modification of the water treatment system to include semi-passive biotreatment and a reverse osmosis system.

Additional mitigations developed in response to scoping and public and tribal comments on the draft and supplemental EIS include:

- burial of pipelines to reduce vandalism and visual impacts and to enhance concurrent reclamation of the pipeline corridor;
- using non-acid generating waste rock for mill pad;
- using propane generators at evaluation adit;
- using reduced-emission diesel engines underground and electric underground ore trucks;
- using a semi-autogenous grinding mill (SAG) (wet process);
- develop an aquatic life mitigation plan for wilderness lakes in conjunction with wetlands mitigation plan;
- developing a site-specific reclamation/revegetation plan in conjunction with the final design for the tailings paste deposit;
- develop a Vegetation Removal and Disposal Plan;
- better define preliminary mine and air-intake ventilation adit closure plans
- pumping of concentrate to the rail loadout to reduce truck traffic on FDR No. 150 to reduce impacts to harlequin ducks and grizzly bears;
- busing of mine workers and visitors from a parking lot in lower Rock Creek area to reduce mine-related traffic on FDR No. 150 and reduce impacts to harlequin ducks;
- limited access to FDR No. 150B from its junction with FDR No. 150 to the paste production plant to reduce traffic immediately adjacent to Rock Creek where the 300 foot-buffer could not be established to reduce impacts to harlequin ducks;
- restricted timing for road construction/reconstruction on FDR No. 150 and 150B and hauling of waste rock to the paste facility site to avoid disturbance to harlequin ducks during the breeding and rearing season from April 1 through July 31;
- finalizing water management plans due to alternate tailings disposal method;
- development of new wetland mitigation plan due to loss of a major mitigation site (borrow site #3 adjacent to Rock Creek would not be developed);
- Sediment Mitigation Plan changed to reduce 400 tons of sediment per year within the Rock Creek Drainage
- 1,000-foot buffer zone around Cliff Lake, Moran Fault, and the north and south ore outcrops and a 450-foot vertical buffer between mine workings and the ground surface;
- changes in grizzly bear mitigation, including 2,350 replacement habitat acres and closure of 2.9 miles of FDR No. 150, instead of closing Chicago Peak Road (FDR No. 2741);
- develop an Evaluation Adit Data Evaluation Plan that incorporates geochemical, rock mechanics, and hydrological monitoring and testing;
- monitoring of vegetation at springs and seeps and coordinated with water resources monitoring;
- cultural resources monitoring during land disturbing activities,
- develop a transportation monitoring plan;

- expand water resource monitoring plan to include hydrologic investigations during evaluation adit construction; new springs and seeps survey and long-term monitoring; monitoring per MPDES permit requirements; monitoring ground water quality and flow in the mine, below the mill, and below the paste facility; ground water monitoring downgradient of the old Noxon landfill; detailed on-going water balance, and a remedial action plan;
- defined aquatics/fisheries mitigation and monitoring requirements and responsibilities; and
- dependent upon water monitoring of mine reservoir water quality, Sterling may have to treat water in reservoir (one option may be to place limestone into the reservoir to treat pH).

Additional mitigations incorporated into Alternative V from requirements in USFWS's Biological Opinion include:

- fund acquisition of bear-proof containers for developed campgrounds in BMU's 4, 5, and 6;
- require mine employees to attend training on living and working in grizzly bear habitat;
- acquire 100 acres within north-south corridor and define timing of replacement acreage and mitigation acreage acquisition;
- establish a trust fund or post a bond to cover mitigation implementation costs;
- sign an MOU with agencies to define roles, timelines, processes, and tasks;
- fund monitoring of recreational use on the Rock Lake and St. Paul Lake trails
- fund telemetry monitoring of grizzly bears;
- define general monitoring of mitigations and annual reporting requirements;
- more detailed complete water shed assessment to better define bull trout populations, habitat conditions, and existing sediment sources to be used to develop stream habitat enhancement;
- defined timing of aquatics/fisheries mitigations;
- work with FWP and USFWS to study bull trout migration past the diffuser;
- evaluate diffuser operational options to allow fish passage above Rock Creek to Noxon Dam and approval by USFWS; and
- additional traffic safety measures to minimize mine-related accidents and spills.

ASARCO has suggested some operational changes at the Agencies' alternative mill site to improve milling efficiency. This included relocating the mine adits and portals to line up with the milling facilities and replacing the secondary crusher with a semi-autogenous (SAG) mill. These changes have been incorporated into Alternative V. Forest Plan amendments to change management allocations would be included with implementation of any action alternative.

AFFECTED ENVIRONMENT

The project area is situated in the Kaniksu National Forest (in Montana, administered by the Kootenai National Forest [KNF]), 13 miles northeast of Noxon in northwestern Montana, at the base of the Cabinet Mountains and adjacent to the CMW. Most of the area is forested. Annual precipitation varies over the area, and is largely influenced by elevation and topography. Rock Creek and its east and west forks, and the Clark Fork River provide surface water drainage.

Public lands, including the Cabinet Mountain Wilderness, are managed by KNF under the multiple use policies of the KNF Forest Plan. Small areas of private land occur in the project area. Timber harvesting, recreation, and wildlife habitat are the predominant land uses. The affected environment is described in detail in this final EIS.

CONSEQUENCES OF THE PROPOSED PROJECT AND ALTERNATIVES

All alternatives would result in impacts of varying magnitude, duration, and importance to resources with regards to the eight issues discussed under Identification of Issues. However, as proposed, Alternatives II through IV for the Rock Creek Project could result in potentially significant or significant impacts to environmental resources specified in seven of the issues. Alternative V could result in significant or potentially significant impacts to resources under six issues. There were no significant impacts under Issue 7 relative to public access and traffic safety. They are briefly summarized below:

Issue 1: Effects on quantity and quality of Montana and Idaho surface and ground water resources.

In Montana, effects are predicted to impact

- the distribution of surface water and ground water resources (all action alternatives);
- aquatic invertebrates from sediment (Alternatives II and III) and nutrient loads (Alternatives II, III, and IV);
- surface water quality from spills and pipeline ruptures (all action alternatives);
- ground water quality from tailings facility seepage (all action alternatives);
- wilderness lake water balance and chemistry and aquatic life from lowered ground water levels (Alternatives II-IV) and the remote possibility of subsidence (all action alternatives); and
- ground water and surface water quality near the orebody due to seepage from the underground mine reservoir (Alternatives II-IV).

No measurable increases to the concentrations of constituents in surface or ground water resources in Idaho are predicted.

Issue 2: Effects on fish and wildlife and their habitats and current and proposed threatened and endangered species.

Effects are predicted to impact

- grizzly bear habitat due to lost and reduced effective habitat and increased mortality (all action alternatives);

- neotropical migrant birds and pileated woodpeckers due to direct and indirect loss of old growth habitat (Alternatives II - IV);
- harlequin ducks due to disturbance, habitat alteration, and increased mortality risk (Alternatives II - IV);
- bull trout due to increased sediment (Alternatives II and III); and
- westslope cutthroat trout due to increased interbreeding with non-native species (Alternatives II, III, and IV).

Issue 3: Stability of the tailings impoundment/paste facility.

Effects from impoundment/paste facility failure are predicted to impact

- surface water quality and aquatic life in lower Rock Creek, the Clark Fork River, Cabinet Gorge Reservoir, Miller Gulch, and to a lesser extent Lake Pend Oreille if failure occurred (all action alternatives).

Issue 4: Impacts to socioeconomics of surrounding communities.

Effects are predicted to

- alter immigration patterns in local area communities (all action alternatives);
- increase the demand for and price of housing in communities near the site (all action alternatives);
- alter existing employment and income patterns and trends in local area communities (all action alternatives); and
- cause increased and fluctuating demand for most public sector services (including schools and water and waste water treatment systems) (all action alternatives).

Issue 5: Effects on old growth ecosystems.

Effects are predicted to

- Directly impact 0 to 28 acres of old growth (all action alternatives).
- Change habitat effectiveness from the existing condition. Effectiveness would be reduced by 19 to 94 acres (Alternatives II through IV), or increased by 1 acre (Alternative V).

Issue 6: Effects on Wetlands and Non-wetland Waters of the U.S.

Effects are predicted to impact

- The functions and values up to 9.6 acres of wetlands and non-wetland waters of the U.S. would decrease until mitigation sites were established (all action alternatives). Between 10 and 13.8 acres (depending on the alternative) have been proposed for wetland mitigation (approximately 1.5:1 ratio).

Issue 8: Effects on aesthetic quality, including noise, visual, and wilderness experiences.

Effects are predicted to impact

- residents at Hereford (Alternative II only) and travelers on FDR No. 150 due to increases in sound levels from mine activities and traffic respectively (all action alternatives);

- visual quality of Rock Creek and Clark Fork Valley and ability to comply with Forest Service VMS standards due to size, shape, color, texture and contrast of mine facilities with surrounding landscapes and the amount of time needed for reclamation/revegetation to mitigate impacts (all action alternatives); and

- wilderness values near the air intake ventilation adit due to visibility and noise levels (Alternative II and to a lesser degree under all other action alternatives).

Table S-3 (located at the back of the summary) provides a summary comparison of the effects of all alternatives with regards to all eight significant issues identified earlier in this chapter. The following discussion provides a more detailed summary comparison of the potentially significant or significant impacts.

Changes in Water Resources

Surface and Ground Water Quality. The Agencies' analyses are based on assumptions about mining, climate, and site conditions during operation and reclamation that cannot be known completely in advance. There are variables that could affect the levels of impacts to surface and ground water quality for nutrients, certain metals, and sediment. These include actual concentrations of nitrogen in the blasting media used, the number of explosive misfires or incomplete reactions, actual waste rock and ore geochemistry, particle size of waste rock and tailings, actual infiltration capacity of the mill and tailings facility sites, rainfall and temperature conditions, actual streamflow, and efficiency of the proposed water treatment facility. These variables are discussed in detail in Chapter 4. The agencies' assumptions are reasonable, conservative (increased safety factor), and protective of water quality.

Alternatives II through V would result in some short-term and possibly long-term changes in existing surface water quality that would comply with Montana and Idaho non-degradation water quality standards. The concentrations would be unmeasurable after dilution with Clark Fork River. This would be due in part to the proposed filtration and treatment of discharged water; concentrations of sediment

and nutrients would be reduced. It is also due to the dilution afforded by the relatively higher flow of the Clark Fork River.

Waste water treatment would be required as long as water being discharged into the Clark Fork River from the impoundment/paste facility, adits, and underground mine did not meet MPDES effluent limits.

The adits could be plugged at their upper end, allowing water entering the adits to drain but holding back water entering the mined out area. If the mine adits were not sealed at their lower ends, which could occur under Alternative II, mine adit water would not be allowed to discharge into Rock Creek as it is unlikely that the adit waters could meet water quality standards relative to Rock Creek. Adit water would have to be perpetually piped, treated if necessary, and discharged to the Clark Fork River. If the adits were sealed after mine closure, as required for Alternatives II - IV, mine water could eventually discharge into bedrock, and possibly out through springs. The most likely locations for these springs are below the outcrop zones at the north and south portions of the ore body and possible in Copper Gulch (DEQ 2001). Water draining from the adits would drain into the mine waste rock fill at the mill site and into the alluvium beneath it and then possibly into Rock Creek.

Prediction of the precise hydrogeologic effects of mine development within a fractured bedrock aquifer is extremely difficult even if numerous monitoring wells are available and the subsurface geology is well known. However, a conceptual scenario of ground water movement has been developed (DEQ 2001) and a summary is provided below.

Void spaces created by underground mining tend to interconnect previously isolated fractures and faults. Prior to mining, some of these structures would have been conduits for ground water while others would not have been connected to sources of recharge and would therefore have been dry or would not have been paths of significant flow. Mining can drain fractures, possibly resulting in loss of flow at pre-existing springs, and can also re-direct water into previously dry fractures, resulting in the formation of new springs. The locations of underground fractures and their relationships to surface features such as springs are frequently impossible to determine prior to mine development. Therefore, effects on springs and seeps cannot be predicted precisely for any action alternative.

Depending on the actual impacts detected during mining, complete plugging of the mine at closure may be preferable or maintenance of mine dewatering after closure may be preferable. Complete plugging of the mine would help to reestablish the pre-mining static head in the bedrock aquifer and reduce ground water drainage stresses on overlying lakes and streams. However, adit plugging could also increase hydraulic gradients and hydrofracturing potential, exacerbating post-mining leakage of mine water to the surface. Continued mine dewatering could reduce the potential of leakage to downgradient streams, but would maintain any mining-induced groundwater drainage stresses on overlying lakes and streams.

With the Rock Creek ore deposit, these factors of uncertainty are compounded by the deposit's location. Drilling monitoring wells within the wilderness would require an unreasonable amount of disturbance and environmental impacts due to the topography (very steep slopes and rock faces) above the deposit. Under Alternative V additional hydrogeologic data would become available during development of the evaluation adit. Piezometers could be drilled into the bedrock aquifer from the underground workings as they advance. Hydraulic conditions within fault zones and under lakes and

streams would be targeted for monitoring. Even without such data, however, it can reasonably be predicted that mining could reduce flows at some springs (mostly above the ore deposit) and will likely increase flows at other springs downgradient of the deposit. Under Alternative V, this data would be used to determine the most appropriate means of adit closure.

Construction of the mill pad, roads, and waste rock dumps would temporarily increase the amount of suspended sediment and nitrogen loads of Rock Creek for Alternatives II and III. The concentration of nitrogen cannot be estimated with certainty and would depend upon the amount of nitrogen contamination of the waste rock, climate, infiltration beneath the mill pad, starter dams, and waste rock piles, and amount of surface runoff circumventing containment barriers and diversion structures. Aquatic invertebrates could be significantly impacted from increased nitrates in the short term. Impacts to aquatic plant communities or algae would be potentially significant in the short term from increases in nitrogen. Alternative III mitigations would reduce sediment loads in Rock Creek lessening the impacts to aquatic life. For Alternatives IV and V, suspended sediment produced from construction of the mill facility, and residual nitrogen from blasting would not affect the West Fork of Rock Creek because the mill would be located farther downstream, there would be less road construction/reconstruction, and there would be no separate waste rock dump although waste rock would be used for mill pad construction under Alternatives IV and V. The 300-foot wide stream buffer around the confluence mill site would further reduce sediment impacts to lower reaches of Rock Creek under Alternatives IV and V. A sediment abatement effort on 130 acres of NFS lands in Rock Creek and/or Bull River watersheds in Alternatives III and IV or the elimination of 400 tons of sediment per year in the Rock Creek drainage would offset expected short-term sediment effects, with the greater estimated reduction under Alternative V.

Impacts to aquatics and fisheries from spills and/or pipeline ruptures could be potentially significant for all action alternatives. The potential for spills to reach surface waters would be somewhat reduced due to consolidation of utility and road corridors and the relocation of the lower portion of FDR No. 150 away from Rock Creek. The potential for spills and rupture would be further reduced by burial of the pipelines under Alternative V. Relocating the mill to the confluence of the east and west forks of Rock Creek under Alternatives IV and V would eliminate the potential for materials from spills and pipeline ruptures to reach the West Fork of Rock Creek.

Changes in ground water quality for all four action alternatives would, for the most part, be restricted to an approved ground water mixing zone that must be approved by DEQ. Under all action alternatives, only nitrates and dissolved manganese would exceed Montana's standards (manganese exceeds the standard in ambient ground water) within the mixing zone. Clays removed for dam stability purposes in Alternatives III through V would be used to seal more permeable areas such as the colluvium at the north end of the impoundment. An engineered perimeter drain and ground water extraction well system would collect and pump seepage back to the tailings impoundment and prevent changes in ground water quality outside of the mixing zone for Alternatives II through IV. Discharge of tailings impoundment seepage to Rock Creek, Miller Gulch, and the Clark Fork River would be nearly eliminated. Frequent monitoring from associated compliance wells would be required to determine the effectiveness of the system and whether or not additional pump-back wells would be needed for Alternatives II through IV or whether a pump-back system needs to be added for Alternative V.

Sterling's water monitoring plan would be expanded for Alternatives III through V and would include a Monitoring Alert Levels and Contingency/Corrective Action Plan. This plan would ensure early detection of potential environmental degradation or impairment and would focus primarily on the protection of surface and ground water resources. The intent of this additional plan would be to prevent pollution and other problems before they occurred. The water monitoring plan would be coordinated with the fishery/aquatics monitoring plan and wetlands mitigation and monitoring plans.

Surface and Ground Water Quantity. Surface water runoff in Miller Gulch would decrease during the life of the project but would impact downstream users. It likely would return to near normal levels after reclamation was complete and when surface water on the impoundment could be discharged into the drainages. The decrease in runoff cannot be quantified but would be greatest during spring runoff and heavy rains throughout the year.

No measurable impacts to streamflows in Rock Creek or the Clark Fork River are predicted under any alternative. However, there is a small probability that surface water flows from springs located around the ore body and adit could be reduced due to project activities. There would be some reduction in ground water flows down gradient from the impoundment due to the extraction wells for Alternatives II through IV. Once the impoundment seepage and ground water quality under the impoundment returned to premine water quality levels, the extraction wells would be turned off. This would allow ground water flows to return to premine levels. Impacts to ground water flows under Alternative V would be negligible unless a pump-back system becomes necessary.

Wilderness Lakes and Wetlands. Sterling proposes to leave a minimum of 100 feet of overburden between mine workings and the ground surface under Alternative II. However, under Alternative V, the vertical buffer between the workings and the surface would be increased to 450 feet and a 1,000-feet horizontal buffer would be required around Cliff Lake, Moran Fault, and the ore outcrop zones. In the vicinity of Copper and Cliff lakes, in excess of 900 feet of overburden exists. Given this thickness of overburden and the inherent strength of the rock, the potential for fracturing and subsidence are extremely remote. Regardless, rock mechanics data from the evaluation adit and mined areas would be required for Alternatives III through V. These data along with operational hydrostatic pressure data would be used for the Agencies' evaluation and approval of updated mine plans prior to mining under the lakes or near outcrop zones. Impacts to wilderness lakes, wetlands, and associated aquatic life from subsidence would be potentially significant for all action alternatives although the potential for subsidence or impacts to the water level or water balance of the lakes would be extremely remote especially under Alternative V. Disruption of ground water supply to lakes, streams, and wetlands is possible (DEQ 2001) under Alternatives II-IV and much less likely under Alternative V.

A contingency plan would be developed to mitigate impacts to the lakes and any associated wetlands to comply with the 404(b)(1) permitting process.

Changes to Wildlife, Habitat, and Threatened and Endangered Species

Grizzly Bears. The proposed project would physically alter habitat due to the construction of mine facilities (584 acres under Alternative II, 609 under Alternative III, 542 under Alternative IV, and 482 under Alternative V). Additional habitat effectiveness would be significantly reduced due to increased human activity. The reduced habitat effectiveness would be greatest during the construction phase; Alternative II would impact the greatest area (8,196 acres) and Alternative V would impact the

least area (7,044 acres). Reduced habitat effectiveness would be less during mine operation; Alternative II would impact 7,308 and Alternative V would impact 6,428 acres.

The increased mortality risk from vehicle-bear collisions, poaching and destruction of nuisance bears could reduce the existing grizzly bear population. Behavior of bears whose territories include the permit area could be modified. Bears could be displaced, feeding patterns could be disrupted, and breeding success interfered with.

The existing Forest Plan standards for grizzly bear management on the KNF have been designed to provide the necessary components for a recovered grizzly bear population (a minimum mortality risk, adequate food supply, spatial distribution of habitat and grizzly bears) across the Cabinet-Yaak ecosystem (CYE). The existing bear management standards are not being met in Rock Creek and the adjacent area. The proposed project would result in a further decrease in the grizzly bear standards for Rock Creek and the surrounding area.

The recent bear management approach to meet Forest Plan standards has been to restrict vehicle use on 6.9 miles of road in the Rock Creek drainage. Alternative II would result in closure of 5.28 miles of road to meet the 0.75 miles of open road per square mile standard for bear analysis areas. Alternatives III and IV would result in closure of 4.18 miles of road to comply with this standard, while 5.22 miles would be closed for Alternative V. These additional closures would not eliminate all the project impacts, but would reduce them. The significance of the impacts is based not only on the need to minimize effects, but on the mandate of the Endangered Species Act to "conserve and recover" the species. To reduce the significance, other mitigation is required that is designed to maintain suitable habitat levels. This mitigation would be phased in over the start up period, commensurate with activity levels, and be fully in place prior to the start of full operations. Mitigation may not prevent incidental taking, therefore, the action alternatives may adversely affect the grizzly bear.

The Threatened and Endangered Species Mitigation Plan for Alternative V incorporated all components of the Reasonable and Prudent Alternative, the Reasonable and Prudent Measures, and the Terms and Conditions identified in the USFWS Biological Opinion. All these items would be necessary to preclude jeopardy to the grizzly bear. Without implementation of these requirements, USFWS has determined the project would jeopardize the continued existence of grizzly bears in the CYE.

Bull Trout. Action Alternatives II, III, and IV would impact resident populations of bull trout in Rock Creek by increasing sediment loads from road construction and runoff. Sediment mitigations contained in Alternatives III, IV, and V should offset some of these impacts. Rock Creek already has a high level of fine sediment in some spawning gravels. Increased sedimentation could significantly reduce fry emergence and potentially lead to reduction of this fish population due to reduced spawning success. Since Rock Creek is one of the major spawning areas for the Cabinet Gorge metapopulation, degradation of Rock Creek bull trout spawning habitat could significantly impact this population. Alternative V would minimize these impacts in the short-term and eliminate them in the long-term by implementing an aggressive sediment mitigation plan which would decrease sediment loading below present conditions.

Alternatives II and III would impact spawning habitat and resident bull trout populations the entire length of Rock Creek from the upper mill site to the Clark Fork River. To the limited extent that the migratory form of bull trout is present in Rock Creek, these two action alternatives could have the

greatest potential impact to the Cabinet Gorge bull trout population. However, under Alternatives III through V, the identification and reduction of existing sediment sources in the Rock Creek drainage by Sterling prior to mine construction would help offset short-term increases in sediment due to facility construction. These mitigations could reduce project-related impacts to the Cabinet Gorge Reservoir bull trout population. BMP and reclamation monitoring would help to identify what mitigations were ineffective or less effective in reducing sediment and help to determine what additional measures would be needed to achieve the desired sediment reduction goals.

Moving the mill site to the Rock Creek confluence (Alternatives IV and V) reduces project-related impacts to populations of bull trout in the West Fork of Rock Creek as well as reducing sediment impacts to spawning habitat and fish populations in Rock Creek below the confluence with its east fork. However, localized increases in fine sediment loading during project construction are likely to adversely affect bull trout individuals.

Under Alternatives II, III, and IV, catastrophic failure of the tailings impoundment could result in an irretrievable loss of resident bull trout. The risk of catastrophic failure would be greatly reduced by using paste technology (Alternative V).

Additional mitigation were incorporated into Alternative V as a result of the USFWS Biological Opinion. Barriers would be installed at stream crossings to reduce the risk of a vehicle and its contents from reaching Rock Creek in case of an accident. Also, Sterling would work with FWP and USFWS to study how bull trout migrated past the diffuser to determine it its design would need to be modified so that the fish could migrate past the diffuser to Noxon Dam.

Water Howellia. Since this species was not found to be present during surveys and since suitable habitat was not found in the project activity area, there will be no direct, indirect, or cumulative effects to Water Howellia or its habitat from any alternative.

Other Terrestrial Threatened and Endangered or Proposed Species. The increased risk of road-killed deer could increase the potential for vehicle collisions with feeding bald eagles along Montana Highway 200 and the railroad. Mitigations for Alternatives III through V include removal of road-killed deer from road rights-of-way. This, in conjunction with busing employees and eliminating the trucking of concentrates, would significantly reduce potential impacts to bald eagles.

Although there are no confirmed sightings of gray wolves within the Rock Creek drainage, suitable habitat would be destroyed and/or rendered ineffective by proposed project activities for all action alternatives. However, the effects are insignificant as suitable den and rendezvous habitat are not present in the Rock Creek drainage which means the likelihood of wolves being residents in the project area is very low.

Lynx is now listed as a threatened species. Lynx habitat would not be significantly affected in any alternative, and none of the alternatives were expected to have a measurable impact on lynx. Mortality risk due to increased trapping pressure may occur; this is under management control should impacts be considered unacceptable in the future. Indirect effects of increased human development attributable to the project may decrease the ability of the low elevation Noxon area to be used as a long distance dispersal corridor. However, the corridor is currently significantly compromised from existing

human developments and the incremental decrease in effectiveness of the corridor attributable to the project's effects are probably negligible.

Big Game Animals. All action alternatives would cause disturbances that could displace big game (deer, elk, moose, and black bear) during part of or all of mine life. Some big game habitat, including travel corridors, riparian areas and a few small bull elk wintering areas, would be altered or destroyed due to construction of mine-related facilities. The increase in traffic, particularly along FDR No. 150, would result in more animal-vehicle collisions. Due to increased human knowledge and use of the area there likely would be more hunting and poaching pressure. Alternatives III through V mitigations would reduce some habitat loss and disturbance, but the overall effects would be similar among all action alternatives. Reclamation and revegetation plans (see Appendix J) for Alternatives III through V would be designed to avoid attracting big game during mine life to help reduce potential problems from big game interfering with reclamation and to avoid creating a mortality risk for the animals. The increased use of native plant species would help achieve the long-term reclamation goal for wildlife habitat restoration.

Neotropical Migrant Birds. The loss of older forests (including old growth habitat) and riparian habitats (Alternatives II through IV) would affect neotropical migrant birds (birds that seasonally migrate from tropical areas such as Mexico to North America). Habitat would be converted primarily to open grass communities, disturbed sites (such as borrow areas and tailings impoundment), or artificial areas (such as roads and buildings). Reclamation and revegetation plans for Alternatives III through V would create a more diverse vegetative habitat that would better replace lost or disturbed habitat than under Alternative II.

Sensitive Animal Species. All action alternatives could have significant to less than significant impacts on some sensitive species in the short or long term. Alternative I would have the least impact; although the development of Sterling lands along Rock Creek if the company sold its lands, could have significant impacts on the harlequin duck. The action alternatives would generally decrease in impact from Alternative II through Alternative V. Indirect effects from increased human development in the surrounding Lower Clark Fork and Bull River valleys would be the most significant, unavoidable impact to most species considered.

The most significant impact would be to harlequin ducks in Alternatives II, III, and IV, where impacts would cause a trend towards federal listing under the Endangered Species Act. Alternative V incorporates mitigation to prevent or avoid impacts such that this trend would not be expected to occur. The impacts to harlequin ducks would be from disturbance from mine-related activities, habitat loss or alteration, water quality impacts, and the risk of a hazardous material spill. Indirect impacts as noted above would also affect harlequins, particularly along the other streams of the Lower Clark Fork subpopulation.

While fisher habitat would be reduced, fisher habitat is widespread on the Kootenai National Forest. Fishers do not appear to be limited by availability of suitable habitat. The habitat loss and increase in mortality risk decreases in impact from Alternative II to Alternative V. The most important key habitat, old growth, is not measurably affected in Alternative V. Mitigation features incorporated into Alternative V would reduce impacts to less than significant. All action alternatives were determined to potentially impact individuals but would not result in a trend towards federal listing of fishers under the Endangered Species Act.

Wolverine habitat would not be significantly affected in any alternative. Because wolverine are wide-ranging animals, the indirect impacts of increased disturbance and increased human development may increase mortality with all action alternatives. Mitigation proposed for grizzly bear would likely be effective in reducing the impacts of disturbance and increased mortality risk, and alternatives with mitigation proposed for grizzly bear would have the least impact. The effects of all the action alternatives were determined to possibly impact individual animals but would not result in a trend towards federal listing of wolverines under the Endangered Species Act.

The increased traffic levels along FDR No. 150 may very slightly increase traffic-related mortality risk to Coeur d'Alene salamander. This level of mortality risk is unlikely to reduce viability for this species because the likelihood of occurrence is considered extremely remote. The action alternatives were determined to possibly impact individuals but would result in a trend towards federal listing. Of the action alternatives, Alternative V has the least risk because of decreased mine-related traffic.

Habitat for northern goshawks would be affected in action alternatives, with direct loss of nesting habitat greatest in Alternative II with 25 acres, followed by Alternatives III and IV with 19 and 1 acres, respectively. Alternative V would remove less than an acre of suitable nesting habitat. All action alternatives would increase the disturbance in the area to goshawks, with effects varying depending on the location of the mill site and the mitigation measures. Alternatives II and III cause disturbance from the mill site because of the configuration of suitable nesting habitat, and Alternatives IV and V would have less impact but would still cause disturbance. Alternative II has the greatest disturbance impact, decreasing in impact through Alternatives III, IV, and V

None of the other sensitive species analyzed were determined to be measurably impacted by the project.

Sensitive Aquatic Species. Pure strains of native westslope cutthroat trout in Rock Creek are at risk from all alternatives, including no action. The risk is slightly increased in Alternatives II, III, and IV due to potential habitat degradation. The pure strain will continue to be diluted by interbreeding with non-native trout. There is no possible mitigation for this outcome.

Plant Species of Special Concern. All action alternatives would disturb or eliminate within the project boundary eleven populations of five plant species of special concern which includes one KNF sensitive plant species. Field verification of population locations would be conducted during field road alignment (to finalize road layout and design) for all action alternatives. Minor road alignment changes could result in avoiding some sensitive plant species populations. If KNF sensitive plant species cannot be avoided, Sterling would have to conduct a conservation assessment. Sterling would have to review surveys whenever lists of KNF sensitive species or MNHP species are updated. If those new plants are found or suitable habitat exist, then new mitigations would be developed to avoid the populations whenever possible.

Mountain Goats. All action alternatives could result in a decline in the Rock Peak goat herd due to increased disturbance, mortality risk and loss of habitat effectiveness. Disturbance could stress goats leading to declining health and reproductive vigor.

Mine-related disturbance would reduce mountain goat habitat effectiveness on up to 990 acres during construction (Alternative IV) and up to 530 acres during operation (Alternative II). Noise

mitigations proposed under Alternatives III, IV, and V would substantially reduce noise and related impacts around the wilderness air intake ventilation adit which is located in important summer habitat. Road closures proposed for several alternatives would result in an increase of habitat effectiveness of up to 549 acres during the operations phase (Alternative V).

Increased access and human recreational use of the area also would increase disturbance and mortality risk. Goat mortality due to poaching and hunting would likely increase as a result. Road closures for grizzly bear mitigation would reduce these impacts.

Impacts on the Rock Peak herd would be compounded when impacts from Noranda also are considered. The shifting of animals out of the Rock Creek and Ramsey Creek drainages into the CMW from either side could increase the stress of the displaced animals. It also could increase the use of unaffected summer ranges creating potential conflicts with resident goats in the CMW.

Pileated woodpecker. Alternatives II, III and IV would have a potentially significant effect on local populations of the pileated woodpecker. This impact would be caused by direct habitat loss or reduced habitat effectiveness on 122 to 30 acres (Alternatives II to IV, respectively). The anticipated small stand size, lower habitat quality, and limited quantity of habitat would affect sustainability of local populations. Alternative V would not measurably affect pileated woodpecker habitat.

Impoundment/Paste Facility Stability

Tailings would be disposed in an impoundment located just west of the lower reach of Rock Creek under Alternatives II through IV. Conceptual impoundment designs were developed assuming a 7.0 earthquake along the Bull Lake Fault 16 miles away. Under Alternative II, the applicant proposed constructing the impoundment using the upstream method. The modified design for Alternatives III and IV specifies the centerline method for 7 years and the upstream method for the remainder of mine operation. The modified design also would include compacting the tailings beach, possible removal of soft clays under the starter dams, and constructing a concrete shear wall under one of the starter dams to reduce the risk of impoundment failure. Although either impoundment design would be subject to review and approval by the Agencies, the modified design for Alternatives III and IV also would be subject to a technical panel review including a review of a feasibility study on the use of alternative methods to reduce seepage. Failure of the impoundment, while a remote possibility, would have a significant impact to surface waters and aquatics/fisheries.

Alternative V incorporates paste technology as the tailings management option. Under this alternative, the tailings would be dewatered to approximately 20% water by weight (vs. approx. 50% by weight under Alts. II-IV), resulting in a material similar in consistency to stiff cement. The paste tailings would be placed via a pipeline system starting either near the perimeter of the proposed impoundment footprint (Bottom-Up approach) or near the top of the final estimated impoundment height (Top-Down approach). The final configuration of the tailings embankment would be achieved through working the slopes with machinery to achieve the desired aesthetic result. The paste is capable of being reworked due to its lower overall moisture content and resulting higher strength characteristics. In addition to having increased strength, the paste also has a higher viscosity than the "wet" tailings in Alternatives II - IV. The paste then has less tendency to flow when it is not contained, and hence a failure of a paste slope would not result in the kind of tailings run-out which could be expected from a "wet" impoundment. While the likelihood of failure of a paste impoundment is considered negligible (less than 1 in 1 million

chances of occurring), there would be an impact to surface waters and aquatics/fisheries should the paste reach a surface water source. This impact has been defined as having a short-term irreversible impact and a long-term excursion of water quality. The final design for the tailings paste facility would be subject to a technical panel review as required for the impoundment under Alternatives III and IV.

Changes in Socioeconomics

Employment, Immigration, and Income. Mine construction would create up to 530 mostly short-term jobs in the local area (western Sanders County, southern Lincoln County, and eastern Bonner County in the vicinity of Clark Fork) and bring in a sudden influx of up to 910 migrants. Roughly 390 of these workers would be laid off when contract construction ended a few months later, causing an exodus of up to 440 people. Employment would then climb to about 500 direct and secondary employees at full mine production, earning a total annual income of approximately $14 million and producing a net local area immigration of up to 980 people. In western Sanders County competition for housing, employees, and services could cause population, employment, and income gains from the project to be at least partially offset by losses in other sources of immigration and economic sectors. Most of the mine-related jobs and income would be lost in a short period at mine shutdown, causing a significant downturn and period of adjustment for the local economy.

Housing. Housing is already in short supply and expensive in western Sanders County and the Clark Fork area of Bonner County, Idaho. Rental units and other short-term housing are especially scarce. Mine development would create a definite housing shortage in this area with the greatest deficiency being short-term housing for contract construction workers. The Troy and Libby areas in southern Lincoln County have greater housing availability, and many workers would live in those communities and commute to the project site. Housing scarcity and cost increases could impact people on fixed or limited incomes. After mining operations ceased, there might be a housing surplus in the area.

Community Services. The suddenness of the contract construction employee and population influx, followed about a year later by an equally sudden exodus, would create a difficult situation for local service providers (schools, law enforcement, emergency, etc.). Demand for their services would suddenly escalate and then would fall off again until the mine reached full production employment. Under the Rock Creek Hard-Rock Mining Impact Plan (ASARCO Incorporated 1997b) local government service providers would receive fiscal assistance in the form of grants and pre-paid taxes to help them deal with mine-generated changes in demand. This fiscal assistance would be valuable but would not solve all the staffing and operating difficulties the providers would face. School systems, in particular could find the fluctuations and turnover in student populations to be a disruptive factor. However, because most area schools are expected to have declining enrollments in the coming years (assuming no mine development), actual capacity or accreditation problems should not arise.

Combined Effects. If the Troy Mine were to reopen and the Montanore Project were to resume development in the same time frame as Rock Creek began development, the socioeconomic effects in western Sanders County and the Clark Fork area would be much greater than those described above. Southern Lincoln county would be able to meet the housing, labor, and community service demands of the Troy and Montanore projects but would have little left to contribute to meeting Rock Creek demands. Western Sanders county would experience a classic boom town situation, with immigration numbers, and demands for housing and services substantially greater than those described above. Very careful

planning and preparation by the applicant and local government would be required to manage the situation.

Fiscal. This project would generate direct increases in property tax revenue to local governments; this would peak at about $600,000 for Sanders County during the second year of production. Additional revenues would be generated by the Gross Proceeds Tax and the Metal Mines License Tax (estimated to be a maximum of $300,000 in Sanders County). Increases in personal property and income taxes would occur as a result of increased employment, personal property taxes, and purchase of local services and merchandise. The applicant's Hard Rock Impact Plan would allocate these tax revenues to more closely match the timing and scope of increased local demands for government services (see above). This plan has been negotiated between the applicant and the local governments (see Chapter 1 and Alternative V description in Chapter 2).

Land Use. All action alternatives would restrict potential postmining land uses (especially residential, commercial, and industrial uses) on about 400 acres at the tailings storage facility site. Minor land use changes would be associated with new mine-related housing and commercial development. The acquisition of land or placement of conservation easements for grizzly bear mitigation would restrict future residential and commercial development on about 3,074 acres for Alternative II, 2,692 acres for Alternative III, about 2,536 acres for Alternative IV, and 2,350 acres for Alternative V.

Changes in Old Growth Ecosystems

Effective Old Growth Habitat. Alternatives II through IV would destroy old growth or reduce its effectiveness. Alternative II would affect a total of 122 acres; Alternative III, 47 acres; and Alternative IV, 30 acres. Because of closure of some open roads, Alternative V would result in a slight increase in habitat effectiveness by 1 acre. Nevertheless, the percent of biologically effective habitat would be below the 8 to 10 percent needed to support old growth dependent species under all Alternatives I through V. However, all action alternatives would meet Forest Plan old growth management standards. Pileated woodpeckers, goshawks, and fishers are among old growth-associated species that would be affected by this loss. A potentially significant decline in local species diversity could result under the action alternatives that reduce old growth.

Changes in Wetlands and Non-wetland Waters of the U.S.

All four action alternatives would fill wetlands and non-wetland waters of the U.S. (see Table 2-6). The tailings storage facility footprint would directly and indirectly impact the similar total amount of wetlands for all action alternatives. Alternative V construction of the paste tailings facility phased-in throughout the 26-30 years of mining would delay the direct and indirect impacts to the wetlands, particularly those located directly under the tailings facility. The location of the mill site and waste rock dump and the alignment of FDR No. 150 determines the total amount of wetlands and non-wetland waters of the U.S. impacted by each alternative. Alternative II would impact a total of 8.1 acres of wetlands and 1.5 acres of non-wetland waters of the U.S. Alternative III would impact a total of 6.2 acres of wetland and 1.5 acres of non-wetland waters of the U.S., and Alternatives IV and V would impact a total of 6.2 acres of wetland and 0.4 acres of non-wetland waters of the U.S. These would be significant impacts.

Temporary indirect impacts to wetlands and non-wetland waters of the U.S. would occur during construction of roads and the mill pad due to increased sediment contributions. Proposed BMPs would reduce sediment contributions. Alternatives II and III would have temporary impacts at specified locations along Rock Creek from the confluence of the east and west forks to the Clark Fork River. Alternatives IV and V primarily would have indirect impacts below the confluence of the East Fork Rock Creek. Very few indirect impacts would be associated with the evaluation adit other than the reconstruction of FDR No. 2741. Alternative V would have nearly the same total acreage of indirect impacts as the other action alternatives, but the timing of the impacts would be delayed throughout the 26-30 years of mining with the past tailings construction.

The applicant has identified 18.9 acres of wetland mitigation sites and 1.5 acres non-wetland waters of the U.S. mitigation sites of which 12.3 were proposed for use under Alternative II (see Table 2-7). Only 10.5 acres of the wetland and non-wetland waters of the U.S. mitigation sites would be available for Alternatives III and IV due to the realignment of a segment of FDR No. 150. The applicant provided a revised wetland mitigation plan to specifically address Alternative V. In the revised plan, Sterling would create 10 acres of wetlands to compensate for the loss of 6.6 acres of wetland and non-wetland waters of the U.S. Mitigation sites would be developed prior to disturbing existing wetland and non-wetland waters of the U.S.

In addition to the revised Alternative V wetland mitigation plan, in 1998 the applicant identified six optional wetland mitigation sites that could be developed if the proposed sites prove to be less successful than anticipated for replacing the lost wetland functions and values (ASARCO 1998b). Approximately 18.9 acres (Table 2-18) have now been identified as suitable for development of wetlands. The 1.1 acres of non-wetland waters of the U.S. at the upper mill site (Alternatives II and III) would not be reconstructed until the mill site was reclaimed. The 0.4 acres of non-wetland waters of the U.S. along the FDR No. 150 and the utility corridor under all action alternatives would be temporarily impacted during construction. The primary functions and values of the created wetlands would be to re-establish diversity and abundance of habitat for aquatic and terrestrial species, reduce sediment transport to Rock Creek, and attenuate peak flows. A temporary but potentially significant decrease in some of the wetland functions and values could occur until the created wetlands were revegetated and fully established.

Changes in Transportation

Public Access. All action alternatives propose both new road construction and road reconstruction. These activities would create traffic delays and temporary road closures. A traffic management plan would allow private landowners reasonable access to their property and public access to NFS lands.

Alternatives II and III would include a bypass around the west fork mill site to allow access to FDR Nos. 150 and 2741 above the mill. However, public access through either mill site or on the mine portal access road (all alternatives) would be restricted. Alternatives III through V would also restrict public traffic on FDR No. 150B around the impoundment.

The paving and widening of FDR No. 150 and upgrade of FDR No. 2741 would improve access to the CMW and for general recreational activities in the drainage. However, road closures would affect motorized recreational access. Under Alternative II, a total of 5.28 miles of road would be closed.

Alternatives III and IV would close a total of 4.18 miles of road and would have slightly less impact than Alternative II to recreationists wanting closer motorized access to the wilderness via Orr Creek Road. A total of 1.88 miles of FDR No. 2741, Chicago Peak Road, would be closed under Alternatives II through IV. Under Alternative V, a total of 5.22 miles of road would be closed, but the Chicago Peak Road (FDR No. 2741) would be left open for easier wilderness access. Alternative V would close 2.9 miles of FDR No. 150 on Government Mountain, thus affecting motorized recreational access in that area. Indirect impacts to some wildlife species would be created by increased accessibility for hunting, trapping and poaching (see Big Game Animals, Sensitive Animal Species, and Mountain Goats). FDR No. 150 above the confluence mill site would not be paved for Alternative IV or V although minor improvements to FDR Nos. 150 and 2741 would occur for access to the evaluation adit; therefore, public access on those roads would remain similar to Alternative I.

Traffic Safety. The proposed project would generate increased traffic on FDR No. 2741 during evaluation activities and on Montana Highway 200 and FDR No. 150 during mine construction and operation for all action alternatives. Alternative III also would increase traffic on the lower portion of FDR No. 2741 during mine operation. Routing ore concentrate haulers along Montana Highway 200 to the Hereford rail loadout would create the potential for increased traffic accidents. Ore trucks would be traveling at slower speeds than general traffic and would be turning across the highway going to and from the loadout. Alternatives III and IV route the concentrate trucks along reconstructed FDR No. 150B at the base of the impoundment to the Government Mountain Road and the Miller Gulch rail loadout. This would eliminate conflicts between ore trucks and general traffic on the highway. Restricting public use of FDR No. 150B also would avoid conflicts on that portion of the haul route. Alternative V eliminates the need for concentrate haul trucks since the concentrate will be piped. Relocation of the rail loadout to Miller Gulch eliminates potential confrontations, including accidents, with residential traffic at Hereford.

Alternative II's proposed road alignment for the intersection of FDR No. 150 and Montana Highway 200 does not meet highway standards for sight distance, increasing the potential for accidents with turning traffic. Alternatives III through V would relocate the road intersection to comply with the standards.

Changes in Aesthetic Quality

Noise. Blasting during adit construction would generate noise up to 80 dBA in the CMW and the Clark Fork Valley. While general mine operations would not be audible in the Clark Fork Valley, the operation of heavy equipment at the impoundment site would be audible in adjacent areas. Activities at the Hereford rail loadout (Alternative II) would significantly increase noise levels to residences in the area. Relocation of the loadout to Miller Gulch under Alternatives III to V would eliminate that impact and place the noise in a less populated area.

Recreationists using the Rock Creek drainage and FDR Nos. 150 and 2741 would be able to hear mine and mill operations when they were within a mile of the facilities. Traffic related noise on FDR No. 150 would be increased significantly from 30 to 70 dBA. The level of the noise would be somewhat reduced in Alternatives III and IV with the implementation of several noise mitigations and to an even greater extent under Alternative V.

Noise impacts to recreationists within the CMW would be associated primarily with the evaluation and wilderness air intake ventilation adits and blasting and construction equipment noises (up to 80 dBA). Impacts from evaluation activities would be greatest during the first couple of years of mine

activities; after that, noise would only be generated by ventilation exhaust fans. Sound from all adits would be audible (at 45 dBA) for approximately 1 mile away from the sites. The wilderness air intake ventilation adit would only be in place and used during the last 15 to 20 years of mining. These sounds would negatively impact CMW visitors using nearby areas. Sound mitigations in Alternatives III through V would reduce the fan noise to background levels (30 dBA) within 100 feet.

Scenic Quality. All four action alternatives would result in significant visual impacts for the Rock Creek drainage and Clark Fork Valley. Impacts would be associated with all features of the proposed project: the evaluation adit, the mill site, the mine portal and associated waste rock dumps, the air intake ventilation adit (see wilderness below), the utility corridors and the tailings impoundment/paste facility.

The evaluation adit portal would be most noticeable from Government Mountain, though the impacts would diminish with distance. Lights from night operations would be visible in portions of the Clark Fork Valley. These visual impacts would be reduced in Alternatives III through V. The waste rock dump would be revegetated to reduce contrast. Lights would be screened or baffled to reduce visibility across the valley.

The upper mill site in Alternatives II and III would be highly visible to the public using FDR Nos. 150 and 2741 but not be visible from the Clark Fork Valley. The conveyor from the mine portal would create a strong linear feature that would contrast greatly with the natural landscape. The cut-and-fill slopes of the new mine adit access road for Alternative II would be visible for a long time. Under Alternative III, the new mine adit access road would not be built, reducing the amount of disturbance and visibility. The buildings would be painted or treated to reduce the amount of contrast.

The waste rock dump for Alternative II would be a prominent feature that would be difficult to revegetate and would remain highly visible for many years. The dump would be divided into two smaller dumps in Alternative III and graded closer to the natural slopes than was proposed in Alternative II. The dumps would be topsoiled and revegetated to facilitate reduction of visual impacts.

Alternatives IV and V would move the mill site to the confluence with the East Fork of Rock Creek. A minimum 100-foot visual buffer would be left on either side of FDR No. 150 to provide screening. There would be no separate waste rock dump for these alternatives as the rock would be used to build the mill pad and the impoundment starter dams or the paste facility toe buttresses. The face of the mill pad would be reclaimed immediately after construction. Visual impacts from the confluence mill site would be potentially significant.

Construction of either design of the impoundment or the paste facility would result in a large artificial form visible from several areas in the Clark Fork Valley. The size, form, color and texture of the tailings disposal facility would contrast dramatically with the surrounding landscape. The long-lasting effects would gradually be reduced as trees and shrubs were established. Revegetation with grass and forbes of the impoundment face would be done concurrently throughout mine life for Alternative II. Trees and shrubs, however, would be planted after the face of the impoundment was completely reclaimed for Alternative II. Alternatives III and IV would require additional detailed regrading and revegetation plans to facilitate the mitigation of visual impacts. Reclamation, including the planting of trees and shrubs for Alternatives III and IV, would begin after year 7 and would be concurrent until operations ceased. Trees would also be planted along Montana Highway 200 for screening as soon as

Agency permits were approved. Under Alternative V, final reclamation would begin on paste surfaces when final grade was achieved with timing dependent on construction sequencing.

With proposed amendments to the Forest Plan under Alternatives II through V, new management areas (MA) MA 31 (Mineral Development) and MA 23 (Electric Transmission Corridor) would have no life-of-mine VQO. A post-mine VQO of Partial Retention would be applied to these management areas and would be met several decades following mine closure with the successful completion of reclamation activities, decommissioning and removal of above-ground facilities, and regrowth of vegetation. The impoundment surface and face under Alternative II may never meet Partial Retention VQO standards.

The prescribed Visual Management System (VMS) VQOs would not be achieved during mine life for all action alternatives. The impoundment surface potentially could never meet Retention VQO standards under Alternative II, but additional reclamation requirements under Alternatives III through V would increase the likelihood that the standard could be achieved within several decades after final reclamation. Under Alternative IV and V, the elimination of the waste rock dump, immediate planting of the mill pad face, and the visual buffer around the confluence mill site would further help this site meet VMS VQO standards. Although the facility sites could eventually achieve prescribed VMS VQOs several decades after mine closure and final reclamation, the additional reclamation requirements would shorten the amount of time required, but it would still take decades.

Wilderness. There would be two types of impacts to users of the CMW: noise-related and visual. The noise-related impacts would be greatest during the construction and operation of the evaluation adit, construction of the mine adits and mine pad and the construction and use of the wilderness air intake ventilation adit (see Noise). Mitigations under Alternatives III through V would reduce these potentially significant impacts. Visual contrast of the impoundment surface would remain for Alternatives II through IV due to its light color until completion of mine revegetation following mine closure. The phased reclamation of the paste facility would reduce its visual impact under Alternative V. The area of disturbance for the air intake ventilation adit would be reduced in Alternatives III through V by its relocation to a steeper site. Either location, however, is not in proximity to high use areas such as Rock, Saint Paul, and Moran lakes. Reclamation mitigations proposed under Alternatives III through V would restore a premining appearance to the air intake ventilation adit.

THE AGENCIES' PREFERRED ALTERNATIVE

The Agencies' preferred alternative is Alternative V, Proposed Project with Tailings Paste Deposition and Alternate Water Treatment. Alternative V would result in construction of the evaluation adit, mine, mill, tailings paste facility, rail loadout, reverse osmosis and passive biotreatment facility, and access roads. The Bottom-Up construction option would be used and final design would incorporate measures to meet visual impact mitigation and reclamation goals. These measures are specified in Scenic Resources - Chapter 4 (see Alternative V Bottom-up Option). Some water would be stored in underground workings, but excess water would be discharged to the Clark Fork River after treatment. Environmental requirements in addition to those proposed by the applicant would be incorporated to avoid and minimize (to the extent possible) or eliminate environmental impacts. Additional monitoring would help detect trends as well as unacceptable impacts, should they occur. Measures would be developed to respond to and control any unacceptable impacts that may be detected.

TABLE S-3
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Water Resources					
Surface water quality	Except for minor increases in sediment, existing surface water quality would be maintained.	Minor increases in metals, nitrogen, ammonia, and total dissolved solids concentrations in Clark Fork River from treated discharges during operations. Must comply with MPDES permit and Montana Water Quality Standards	Same as Alternative II	Same as Alternative II	Similar to Alternative II but with increased water treatment reliability and minor increases in phosphorus due to changes in waste water treatment systems.
	N/A	**Nitrogen loads would be temporarily increased in Rock Creek and the west fork during mine construction and would impact aquatic invertebrates and algae in the short term.**	**Same as Alternative II**	Similar to Alternative II but impacts to the aquatic life in the West Fork of Rock Creek above the confluence mill site would be much reduced. The 300' buffer zone around confluence mill site would reduce nitrogen loading to Rock Creek from the waste rock used in mill pad construction.	Same as Alternative IV.
	Sediment-loading for Rock Creek may temporarily increase due to construction of roads and land clearing for timber sales.	Sedimentation may be reduced because timber road construction for NFS lands in the Rock Creek drainage may be limited due to project increased open road densities.	Same as Alternative II plus sediment would also be reduced by relocating a portion of FDR No. 150 and the utility corridor and by identifying and reducing existing sediment sources.	Same as Alternative III.	Same as Alternative III plus additional sediment reduction due to fewer roads, paste facility construction, modified reclamation plans, reduction in mine-related traffic, and sediment mitigation on two or more sediment sources in Rock Creek.
		Impacts from materials from spills and pipeline ruptures potentially could affect water quality in Rock Creek and the Clark Fork River.	**Same as Alternative II except the potential for material from spills and pipeline ruptures to reach the main stem of Rock Creek is reduced.**	**Same as Alternative III except potential for spills and pipeline ruptures in the West Fork of Rock Creek would be eliminated due to mill site relocation.**	Potential for pipeline ruptures would be reduced because tailing, process water, and ore concentrate pipelines would be double-walled with leak detection. Impacts from spills of ore concentrate would be minimized by piping to an enclosed rail loadout facility and all pipelines would be buried except at bridge crossings.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Ground water quality	Ground water quality would be similar to existing quality.	Ground water quality standards for nitrates and dissolved manganese would be exceeded within an approved mixing zone during construction and operation of tailings impoundment. Downgradient ground water quality would not be affected beyond the mixing zone as a result of a ground water extraction and pump-back system. Ground water quality near the ore body may decrease due to seepage from the underground mine reservoir.	Similar to Alternative II, except impoundment seepage would be reduced by using excavated clays to seal permeable contact zones. The technical panel reviewers for impoundment design would investigate the use of seepage reduction techniques (which may include synthetic or clay liners) to further minimize seepage if acid-base accounting of tailings indicated potential for acid drainage.	Same as Alternative III.	Similar to Alternative III; however, tailings seepage would be reduced by one order of magnitude to approximately 20 to 30 gpm due to paste technology.
Surface water quantity	Appropriated water would continue to be withdrawn from surface water.	Surface flow in Miller Gulch would be reduced during operations. Slight potential for ground water withdrawal to reduce surface flows of springs.	Same as Alternative II.	Same as Alternative II.	Similar to Alternative II.
Ground water quantity	Ground water well production from appropriated sources would be similar to existing production.	Possible decrease in static water levels in wells not in Clark Fork alluvium and spring flow downgradient of Miller Gulch during operation.	Same as Alternative II.	Same as Alternative II.	Same as Alternative II.
		Portal plugging and subsequent mine flooding may generate downgradient springs	Same as Alternative II.	Same as Alternative II.	1,000-foot buffer zone along ore outcrop zones plus a 450-foot vertical buffer between the mine workings and the surface should minimize the potential for the creation of post-mining springs and seeps. Adit closure plans would be finalized depending on impacts that occurred.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Springs and Seeps and Wilderness lakes	Springs and seeps and wilderness lakes would continue to experience natural and seasonal water level fluctuations.	**The potential for subsidence is remote. Impacts would be potentially significant. Lakes could potentially be drained if subsidence reached the surface. Ground water drainage stresses would affect ground water recharge and water chemistry of wilderness lakes and springs.**	**The potential for subsidence and ground water drainage stresses to wilderness lakes and springs, although remote, would be further quantified by additional rock mechanics studies and a subsidence control plan. Impacts would be potentially significant.**	**Same as Alternative III.**	**Similar to Alternative III, but 1,000-foot buffer zones around Cliff Lake and the north and south ore outcrop zones would minimize the risk of affecting water levels and water chemistry to the lakes and springs. Possibility of occurrence would be remote.**
Wildlife, Habitat, and Threatened & Endangered (T&E) Species					
Grizzly bears	Continued availability of spring and fall grizzly bear habitat.	**Direct physical loss of 584 acres of habitat. Habitat effectiveness would be reduced on an estimated 7,308 acres during operation. This would have a potentially significant impact on grizzly bear habitat. Decrease in habitat effectiveness in all impacted BMUs.**	**Direct physical loss of 609 acres of habitat. Habitat effectiveness would be reduced on an estimated 7,001 acres during operation. This would have a potentially significant impact on grizzly bear habitat.**	**Direct physical loss of 542 acres of habitat. Habitat effectiveness would be reduced on an estimated 6,635 acres during operation. This would have a potentially significant impact on grizzly bear habitat.**	**Direct physical loss of 482 acres of habitat. Habitat effectiveness would be reduced on 6,428 acres during operation. This would have a potentially significant impact on grizzly bear habitat. Mitigations from the BO would reduce this impact and preclude jeopardy**
	Slight increase in habitat effectiveness due to road closures.	The KNF determined there would be a need to close 5.28 miles of roads (see Transportation) to meet the open road density standards for grizzly bear habitat.	Open and total road densities would be reduced by closing 4.18 miles of road in order to maintain and improve grizzly bear habitat effectiveness.	Same as Alternative III.	Open and total road densities would be reduced by closing 5.22 miles of road in order to maintain and improve grizzly bear habitat effectiveness.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Grizzly bears (Continued)		Potential increased mortality from road kills, poaching, and destruction of nuisance bears.	Similar impacts as Alternative II but somewhat reduced due to additional mitigations.	Same as Alternative III.	Similar to Alternative III, but potential decreased even more due to required training of workers about working and living in grizzly bear habitat, and implementing of a food storage order for the BMUs affected by the project.
Bull trout	Private and KNF timber sales and other developments within the Lower Clark Fork River watershed should maintain the functioning of habitat for bull trout.	**Increased sediment in the west fork and mainstem of Rock Creek would significantly decrease emergence success of bull and cutthroat trout fry.**	**Modifications and mitigations would reduce the amount of sediment impacting Rock Creek spawning habitat for bull trout in Rock Creek.**	**Sediment impacts to bull trout would be minimized in the West Fork of Rock Creek. The 300 ft. buffer around the confluence mill site would reduce impacts from sediment loading downstream.**	**The lesser amount of disturbed acreage, relocation of evaluation support facility, and sediment mitigations prior to construction should further reduce sediment impacts in the short term. Additional sediment mitigation and negotiation with land owners to reduce sediment sources may improve habitat in the long term.**
	Natural changes in aquatic habitat are expected, marginal threat to long-term survival for Cabinet Gorge bull trout stock.	**Potential increase in non-native fish species abundance and interbreeding with bull trout.**	Risk of interbreeding and non-native fish species increase would be reduced due to sediment mitigations.	Similar to Alternative III.	Additional sediment mitigation would further reduce risk of interbreeding and non-native fish species increases. Study of bull trout migration past the diffuser could result in diffuser design modification to ensure passage past the diffuser to Noxon Dam and allow capture of fish and movement upstream beyond the dam.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Bull Trout (Continued)	N/A	**Catastrophic failure of the tailings impoundment could result in an irretrievable loss of bull trout.**	**Similar to Alternative II.**	**Similar to Alternative II.**	Risk of catastrophic failure of tailings facility reduced by using paste technology, hence risk to fish is also reduced.
Other T&E species (including proposed species)	Bald eagle use would continue to increase. Mortality risk would remain unchanged.	**Increases in road-killed deer could slightly and indirectly increase mortality risk of bald eagles along MT Hwy. 200, FDR No. 150, and along the train tracks near the Hereford siding.**	Increases in road-killed deer and associated bald eagle mortality risk along MT Hwy. 200 is less than Alternative II because of rerouting concentrate haulers to the Miller Gulch rail loadout along FDR No. 150B and daily removal of road-killed animals.	Same as Alternative III.	Mortality risk is lowest due to additional reductions in traffic on FDR 150 from bussing employees between water treatment and mill site facilities.
	Transient wolf would continue to use the Clark Fork River drainage.	Similar to Alternative I.	Same as Alternative II.	Same as Alternative II.	Same as Alternative II.
	Habitat for lynx, would continue to be reduced as fragmentation and habitat degradation continued. Disturbance and mortality risk would continue to increase slowly as regional human population increased.	Lynx habitat quality reduction (especially old growth, riparian areas and travel corridors) and disturbance could displace animals.	Similar to Alternative II.	Moving the mill site and impacting less old growth would reduce the impact below Alternative III.	Change in effectiveness of old growth would be essentially unmeasurable. Mortality risk further controlled through mitigation measures.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Big game animals	There would be no increase in existing animal-vehicle collisions unless there are other increases in use in the Rock Creek drainage from public or private timber sales and as human population in the area grew over time.	Increased potential for animal-vehicle collisions.	Similar to Alternative II.	Similar to Alternative II.	Lowest increased potential for animal-vehicle collisions because busing of employees and reduced open road density would reduce the number of vehicles on the roads and the amount of open roads where collisions could occur.
	Minor changes in habitat or activities of big game animals; security could be improved as open road densities were reduced.	Minor loss of habitat for game species including travel corridors, riparian areas and a few small bull elk wintering areas.	Similar to Alternative II.	Habitat loss associated with the mill in the upper West Fork of Rock Creek would be shifted to the confluence mill site.	Habitat loss is the least of the action alternatives.
	Displacement and possible increased mortality of animals due to increased human development in Rock Creek if Sterling releases its Rock Creek lands.	Displacement and possible increased mortality of animals due to increased human use and activities (including hunting and poaching).	Somewhat less impact because of road closures.	Similar to Alternative III.	Same as Alternative III.
Neotropical migrant birds	Minor changes in forested habitat or activities of neotropical migrant birds unless Sterling releases its Rock Creek lands for development. Increased homesites could decrease bird diversity by introduction of pest species and direct habitat loss.	**Direct and indirect loss of old growth, riparian, and wetland habitats would affect songbirds in those areas. Potential loss of individual birds.**	**Same as Alternative II.**	**Same as Alternative II.**	Substantially similar to Alternative I for old growth and same as Alternative II for riparian and wetland habitat.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Sensitive animal species	Stability of harlequin duck population in lower Clark Fork would remain vulnerable.	**Human disturbance and habitat alteration could result in loss of harlequin duck reproduction on Rock Creek. Loss of Rock Creek breeding area would increase vulnerability of the lower Clark Fork harlequin subpopulation.**	**Impacts to harlequin ducks and their habitat lessened with relocation of FDR No. 150 out of the riparian area but remain potentially significant and similar to Alternative II.**	**Similar to Alternative III.**	Impacts to harlequin ducks and their habitat less than other action alternatives because of busing mine employees, slurrying concentrates and seasonal closing FDR No. 150B, operating limitations, and moving of the evaluation adit support facilities site.
	Habitat for fishers and wolverines would continue to be reduced as fragmentation and habitat degradation continued. Disturbance and mortality risk would continue to increase slowly as regional human population increased.	Fisher and wolverine habitat quality reduction (especially old growth, riparian areas and travel corridors) and disturbance could displace animals. Impacts would not lead to a trend toward federal listing.	Similar to Alternative II.	Moving the mill site and impacting less old growth would reduce the impact to fisher and wolverines below Alternatives II and III.	Change in effectiveness of old growth would be essentially unmeasurable from Alternative I. Mortality risk to fisher and wolverines further controlled through mitigation measures.
	Disposition of lands in Rock Creek by Sterling could increase human development in drainage with resulting impacts to harlequin ducks, fisher and resident birds.	Potential increases in hunting, trapping, poaching, and traffic collision mortality would add to the overall decline of fisher and wolverine security in the Cabinet Mountains, and the region.	Similar to Alternative II.	Similar to Alternative II.	Busing mine employees decreases risk of mortality from vehicle collisions and vehicle disturbance.
	Northern goshawk habitat would increase over time as forests aged.	Direct habitat loss and disturbance to nesting northern goshawks would be greatest of action alternatives.	Similar to Alternative II except fewer acres of nesting habitat lost.	Similar to Alternative III but very little direct loss of nesting habitat. Disturbance effects similar to Alternative III but less.	Direct nesting habitat loss virtually unmeasurable (0.04 acre). Foraging habitat loss least of action alternatives. Disturbance effects least of action alternatives but remain higher than No Action.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Other sensitive aquatic species	Long-term risk to pure strains of westslope cutthroat trout from hybridization with non-native trout	**Slightly increased risk due to increased sediment loading.**	**Similar to Alternative II.**	**Similar to Alternative II.**	Additional sediment mitigation would reduce risk close to no action levels.
Plant species of special concern	Eleven populations of 5 different plant species of special concern within the permit area would remain undisturbed. Crested Shield fern was not found in study area.	Eleven populations of 5 species of special concern would be eliminated.	Eleven populations of 5 species of special concern would be eliminated if they cannot be avoided during construction. If KNF sensitive species cannot be avoided, a conservation assessment must be performed and a mitigation plan may be needed.	Same as Alternative III.	Similar to Alternative III, however a requirement to revisit surveys whenever updated lists of sensitive plant species or MNHP species are prepared would help to reduce or avoid impacts on those new species.
Mountain goats	Habitat effectiveness is 91% in key summer habitat and 100% in winter habitat. Mortality risk would remain as is.	Project-related noise and disturbance would change habitat effectiveness to 85-91% in key summer habitat. Increased mortality risk would occur due to increased human use of the area by recreationists, hunters, and poachers.	Project-related noise, disturbance, and facility location would change habitat effectiveness to 86-93% in key summer habitat. Similar to Alternative II, but additional road closures would reduce mortality risk.	Project-related noise, disturbance, and facility location would change habitat effectiveness to 87-92% in key summer habitat. Similar to Alternative III.	Similar to Alternative IV. Project-related noise disturbance, and facility location would change habitat effectiveness to 86% in key summer habitat. No changes to winter habitat effectiveness. Similar to Alternative III, but mitigation includes increased law enforcement and monitoring to control mortality risk.
Pileated woodpecker	Habitat availability to sustain local populations of pileated woodpeckers would remain below recommended biologically sound levels. Effective old growth currently is 867 acres.	**Effective old growth would reduce 14% (122 acres) to 745 acres, which would potentially significantly affect sustainability of local pileated woodpecker populations.**	**Effective old growth would reduce 5% (47 acres) to 820 acres, which would potentially significantly affect sustainability of local pileated woodpecker populations.**	**Effective old growth would reduce 3% (30 acres) to 837 acres, which would potentially significantly affect sustainability of local pileated woodpecker populations.**	Effective old growth would remain substantially the same, resulting in similar effects as Alternative I.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Impoundment/Paste Facility Stability	No tailings impoundment would be constructed, therefore no risk of failure.	Risk of impoundment failure would be possible but remote. **Impacts from an impoundment failure to surface waters and aquatics would be potentially significant.**	Modified design and construction details as well as a technical panel review of the design would further reduce the risk of impoundment failure. **Same as Alternative II.**	Same as Alternative III. **Same as Alternative II.**	Modified design and use of paste tailings along with a technical panel review of the design further reduce the risk of paste facility failure. **Similar to Alternative II but likelihood of tailings reaching surface would be greatly reduced with paste technology and risk of occurrence would be remote.**
Socioeconomics Employment	Projected increase of 650 jobs (17%) in Sanders Co. & 2000 jobs (22%) in Lincoln Co. between 1995-2020, with all growth occurring in the finance/education/government & service sectors.	**Mine-based direct and secondary employment peaking at 531 during evaluation adit construction then dropping to 143 during mine development and construction. Operating period employment of 497, mostly in resource commodity sector. Possible loss of some Sanders Co. jobs tied to retirement/amenity immigration anticipated under Alternative I. Operating phase duration of up to 30 years, after which most mine-related employment would be lost.**	**Same as Alternative II**	**Similar to Alternative II, but employment during evaluation adit construction would peak at 432 before dropping to 252. Mine operations would provide 476 direct & secondary jobs, for 20 to 30 years.**	**Same as Alternative IV**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Population	Bonner Co. experiencing rapid growth & Sanders Co. moderate growth based on retirement/amenity immigration. Lincoln Co., relatively slow growth.	**Local area immigration peaking at 909 persons then dropping to 467 during construction, before growing to 982 during mine operations. In western Sanders Co. mine-based immigration could be offset by reduced retirement/amenity immigration resulting in minimal population change from Alternative I projections.**	**Same as Alternative II**	**Similar to Alternative II, but construction-related immigration numbers would peak at 772 before dropping to 456. Operations related immigration would be 861. The construction period influx would arrive later in development phase.**	**Same as Alternative IV**
Income	Total area personal income increasing proportional to population growth, with modest gains in per capita income.	**Annual earnings from direct and secondary mine-related employment totaling about $14 million. Net earned income increase in western Sanders County could be minimal, if mine reduces retirement/amenity immigration. Local area would lose this source of income at mine shutdown.**	**Same as Alternative II**	**Similar to Alternative II, but annual earnings from mine-related employment would total about $13.5 million.**	**Same as Alternative IV**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Land Use & Housing	Land use conversion from timber/agriculture to residential/recreation would continue—rapidly in Bonner & western Sanders Co., more slowly in Lincoln Co.	Similar pattern of land use conversion to Alternative I. Mine permit area of about 2,400 acres with about 584 acres of surface disturbance expected. About 3,074 acres of private land dedicated to grizzly bear habitat mitigation.	Similar to Alternative II but about 609 acres of surface disturbance. About 2,692 acres of private land dedicated to grizzly bear habitat mitigation.	Similar to Alternative II, but about 542 acres of surface disturbance. About 2,536 acres of private land dedicated to grizzly bear habitat mitigation.	Similar to Alternative II, but about 482 acres of surface disturbance. About 2,350 acres of private land dedicated to grizzly bear habitat mitigation.
		About 400 acres at impoundment site would be unusable for most existing land uses.	Same as Alternative II	Same as Alternative II.	Similar to Alternative II.
		Approximately 3,074 acres of private lands needed for grizzly bear mitigation would be removed from future development.	Approximately 2,692 acres of private lands needed for grizzly bear mitigation would be removed from future development.	Similar to Alternative III except that only 2,536 acres of private lands would be removed from future development.	Similar to Alternative III except that only 2,350 acres of private lands would be removed from future development.
	Housing continuing to be relatively scarce and expensive in Bonner & western Sanders Co., but more available and less costly in Lincoln Co.	**There would be a substantial short-term housing shortage in western Sanders Co.** **During contract construction. Long-term housing for permanent employees would be scarce and expensive. Some workers during both periods would be forced to commute an hour, or more, to the work site.**	**Same as Alternative II**	**Similar to Alternative II, with slightly reduced housing demand during both the construction and operating periods.**	**Same as Alternative IV**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Community Services	Moderate increases in demand for already burdened community services.	Most residential and commercial development would have to use private water supplies & septic systems. Some school systems could experience disruptive effects from the sudden influx & departure of students during mine construction. Facility capacity and accreditation not expected to be at issue. Other public service providers may have difficulty adjusting to changes in demand for services as mine employment fluctuates during development.	Same as Alternative II	Similar to Alternative II, with slightly fewer people needing services and schools than under Alternative I. Schools and other service providers would have more time to prepare for the construction period population influx than they would have under Alternative II. There would also be a slightly smaller departure of people at the end of construction and influx of people for mine operation than under Alternatives II and III. This would lessen the impacts to community services during employment fluctuations.	Same as Alternative IV
Fiscal	Increases in local government revenue from new development probably would not pay the costs of increased service demand.	Sanders County & the Noxon schools receive substantially increased tax revenue. Other local taxing districts receive some revenue from tax base sharing. The Hard-Rock Mining Impact Plan helps to mitigate fiscal problems associated with project impacts.	Same as Alternative II	Same as Alternative II	Same as Alternative II

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Old Growth Ecosystems					
(excludes replacement old growth)	Approximately 6.2% of Compartment 711 would remain in effective old growth habitat. This percentage would change over time due to natural succession and natural occurrences, (e.g., fire).	**About 122 acres of effective old growth habitat would be lost or degraded. Effective old growth habitat would decline to 5.3% of Compartment 711.**	**About 47 acres of effective old growth habitat would be lost or degraded. Effective old growth habitat would decline to 5.9% of Compartment 711.**	**About 30 acres of effective old growth habitat would be lost or degraded. Effective old growth habitat would decline to 6.0% of Compartment 711.**	Essentially the same as Alternative I.
	Effective old growth habitat would remain below the recommended levels to provide for long-term maintenance of old growth dependent species in Compartment 711 but would increase over time.	**Biological diversity would be reduced and long-term occurrence of old growth dependent species would be unlikely.**	**Similar to Alternative II, except the likelihood of long-term maintenance of old growth dependent species is improved over Alternative II.**	**Similar to Alternative II, except the likelihood of long-term maintenance of old growth dependent species is improved over Alternative III.**	Essentially the same as Alternative I.
Wetlands and Non-wetland Waters of the U.S.					
Wetlands & riparian zones	Wetland and riparian zones could be disturbed by timber sale roads and development of private lands.	**A total of 9.6 acres of wetlands and non-wetland waters of the U.S. would be disturbed by the project.**	**About 7.7 acres of wetlands and non-wetland waters of the U.S. would be affected.**	**Less than 6.6 acres of wetlands and non-wetland waters of the U.S. would be disturbed.**	**Similar to Alternative IV.**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Wetlands & riparian zones (Continued)	N/A	**Functions and values may decrease until the 13.8 acres of wetlands and non-wetland waters of the U.S. mitigation sites were established.**	**Similar to Alternative II but only 10.5 acres of wetlands and non-wetland waters of the U.S. mitigation sites have been identified.**	**Same as Alternative III.**	**Similar to Alternative II, about 10 acres of wetlands mitigation sites are proposed to be created (1.5:1 ratio) within the 18.9 acres identified for potential mitigation.**
	N/A	< 1.5 to 1 acre wetland mitigation ratio	< 1.5 to 1 acre wetland mitigation ratio	> 1.5 to 1 acre wetland mitigation ratio	> 1.5 to 1 acre wetland mitigation ratio
Springs and Seeps and Wilderness lakes	N/A	**Aquatic life, wetlands, and riparian areas associated with Cliff and/or Copper lakes could be significantly impacted by lake drainages or changes in water chemistry if subsidence or drainage-induced habitat stresses occurred. Acres that would be affected are not known and could vary depending on effect on lake water levels and water chemistry.**	**Potentially significant, short-term impacts to wetlands and aquatic life associated with Cliff and/or Copper lakes would be mitigated in accordance with a mitigation plan if subsidence occurred.**	**Same as Alternative III.**	**Similar to Alternative III. 1,000-foot buffer zones around Cliff Lake and the ore outcrop zones and 450-foot vertical buffer between mine workings and surface should avoid impacts to wilderness lakes, springs, and seeps and associated vegetation. Monitoring of the vegetation along with water resources monitoring should help to identify if impacts were occurring and help identify possible mitigations if necessary.**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Transportation					
Public access	Public access for hunting, fishing, hiking and other recreational activities would remain the same.	There may be delays and temporary road closures during road construction and reconstruction.	Similar to Alternative II.	Similar to Alternative II.	Similar to Alternative II.
		N/A	FDR No. 150B between Engle Creek and Government Mountain Road west would be restricted to mine-related traffic.	Same as Alternative III.	FDR No. 150B would be closed during operation between Engle Creek and paste plant.
	N/A	Paving of FDR No. 150 and widening of FDR No. 2741 would improve year-round public access to the CMW and for general recreational activities.	Same as Alternative II.	Public access from FDR Nos. 2741 and 150 above the confluence of the east and west forks of Rock Creek would remain similar to Alternative I.	Similar to Alternative I.
	KNF would use roads on an as needed basis but none proposed.	KNF would need to close 5.28 miles of road (1.88 mi. of FDR No. 2741-Chicago Peak Rd., 0.18 mi. of FDR No. 2741x, 0.5 mi. of 2741A, and 2.71 mi. of FDR No. 2285-Orr Gulch Rd.)	Same as Alternative II but 4.18 miles - would close 1.61 miles of Orr Gulch Rd.	Same as Alternative III.	Similar to Alternative III, but close 5.22 mi. of road (2.92 mi. of FDR No. 150, closed and not close 1.88 mi. of FDR No. 2741)
Traffic safety	Traffic volumes and accident risk would grow or decline with population changes, timber sales, and development of private lands.	The average daily traffic (ADT) for Montana Hwy. 200 would increase by 71 percent during construction and by 38 percent during mine operation. The ADT for FDR No. 150 also would increase by 2,800 percent and 1,440 percent, respectively. This would increase the chances for traffic-related accidents on these roads.	ADT would remain essentially the same as in Alternative II. Any carpooling would reduce ADT.	Similar to Alternative III, except that ADT on FDR Nos. 150 and 2741 above the confluence of the east and west forks of Rock Creek after evaluation was completed would be similar to Alternative I.	ADT on Hwy 200 would be the same as Alternative II. With busing of mine employees, the ADT on FDR No. 150 would increase 1,100 percent over Alternative I during construction and 200 percent during mine operation. Above the mill site, the traffic would be similar to Alternative I.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Traffic Safety (Continued)	Traffic to Hereford rail siding and Government Mountain (FDR No. 150) would remain at existing levels.	Slow moving ore concentrate trucks traveling to and from the Hereford rail loadout would be turning onto and off the Montana Hwy. 200. This would create additional hazards to higher speed highway traffic and residential traffic at Hereford.	Ore concentrate truck traffic would be eliminated from Montana Hwy. 200. ADT on FDR No. 150B from Engle Creek to the Miller Gulch rail loadout would show a slight increase.	Same as Alternative III.	Ore concentrate would be slurried from mill to rail loadout thus eliminating the need for concentrate trucks.
	N/A	Road alignment of FDR No. 150 and MT Hwy. 200 intersection could increase potential for accidents.	FDR No. 150 and Montana Hwy. 200 intersection location complies with state standards and would not increase potential for accidents.	Same as Alternative III.	Same as Alternative III.
Aesthetic Quality Noise	Existing noise levels in the Rock Creek drainage and Clark Fork Valley would be maintained except for changes associated with timber sales and private land development.	Blasting during adit construction would generate sounds up to 125 dBA within 900 feet of the blast and up to 80 dBA within the Clark Fork Valley and the CMW. Construction equipment would generate sounds up to 110 dBA within 50 feet.	Similar to Alternative II except that sound mitigations to construction equipment could reduce noise levels.	Same as Alternative III except that moving the mill to the confluence would increase the buffer between the mill/mine operations and the CMW to 1.25 miles. Operational noise levels would be about 35 dBA at the CMW boundary.	Same as Alternative IV.
		Mine operation noise levels of 52-62 dBA are lower than construction noise levels but still greater than premine conditions and would generally be inaudible in Clark Fork Valley.	Implementation of sound mitigations (e.g. reduce backup beeper volumes, dampen exhaust and intake fan, and retain vegetative buffers) would reduce operation noise levels.	Same as Alternative III.	Same as Alternative III.
		Traffic related noises would significantly increase on FDR No. 150 from 30 to 70 dBA.	**Similar to Alternative II.**	**Similar to Alternative II.**	Busing of mine employees would reduce traffic frequency by 72 percent compared to Alternative II. This would in turn reduce the frequency of traffic-related noise.

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Noise (Continued)		**Activities at the Hereford rail loadout facility would generate noise up to 87 dBA daily between 8 a.m. and midnight. This would increase noise levels to residences in the area.**	Noise-related impacts to Hereford residences would be avoided by moving the rail loadout to the Miller Gulch site. Sound levels at Miller Gulch would be similar to those at Hereford (Alternative II), but there are no nearby residences that would be impacted.	Same as Alternative III.	Similar to Alternative III but enclosure of the rail loadout facility would tend to muffle noise levels.
		Ventilation fans would operate continuously at about 123-96 dBA and would be heard at about 45 dBA up to a mile away (450 acres) for the last 15-20 years of mine operation. This would significantly affect the solitude expected by people visiting the area of the CMW near the adit.	Relocation of the air intake ventilation adit and sound mitigations for the ventilation fans would reduce the noise level to 30 dBA within 100 feet of the adit, and affect an estimated 12 acres. This reduces the impact to CMW visitors.	Same as Alternative III.	Same as Alternative III.
Scenic quality	Visual character of the Rock Creek drainage and the Clark Fork Valley would be retained.	**Significant impacts to Rock Creek drainage and Clark Fork Valley from project features during construction and operation.**	**Significant impacts somewhat reduced by painting or staining mill facilities and immediate revegetation of cut slopes and waste rock dumps.**	**Similar to Alternative III except impacts at confluence mill site further reduced by visual buffer along FDR No. 150 and immediate revegetation of mill pad face following construction.**	**Same as Alternative IV.**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Scenic Quality (Continued)		**Impoundment visibility would significantly impact travelers on MT Hwy. 200 due to lack of screening and postponement of planting trees until after mine closure and topographic changes.**	Impoundment visibility along MT Hwy. 200 reduced by planting vegetative screen and concurrent planting of trees and shrubs after year 7 of impoundment construction.	Same as Alternative III.	Paste facility visibility along Montana Hwy. 200 reduced by vegetative screen. Phased reclamation of deposit incrementally reduces deposit visibility, but effectiveness varies with deposition options.
		Impoundment surface highly visible in background for CMW users on high trails and peaks.	Similar to Alternative II, but long-term visibility reduced due to changes in revegetation plan.	Same as Alternative III.	Same as Alternative III.
		Utility corridor visible to people using FDR No. 150 except for cross country sections.	Utility corridor more visible because it follows the road.	Similar to Alternative III but shorter length.	Similar to Alternative III but all pipelines buried except at stream crossings.
	Forest Plan and Visual Management System (VMS) Visual Quality Objectives (VQO) would be used for future timber sales or other KNF management activities.	**The prescribed VMS VQOs would be impossible to achieve during mine life, but revised Forest Plan MAs would have no life-of-mine VQOs.**	**Same as Alternative II.**	**Same as Alternative II.**	**Same as Alternative II.**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Scenic Quality (Continued)		**The impoundment surfaces could potentially never meet VMS Retention or Partial Retention VQO standards.**	**Additional reclamation requirements would increase the likelihood the impoundment surface would achieve VMS VQO standards within several decades.**	**Same as Alternative III.**	**Same as Alternative III.**
		The mill site and utility corridor would achieve the Forest Plan VQO of Partial Retention several decades after mine closure.	**Additional plantings for screening, concurrent planting of trees and shrubs on impoundment face after year 7 of construction, and other additional reclamation requirements would shorten the amount of time needed for mine facilities to achieve Forest Plan VQO standards, but it would still take decades.**	**Similar to Alternative III, except that the elimination of the separate waste rock dump, immediate planting of the mill pad face, and the visual buffer would further help the site achieve Forest Plan VQO standards after several decades.**	**Similar to Alternative IV for the confluence mill site. Final reclamation that would occur yearly on the front face of the paste deposit (with bottom up construction) would help achieve Forest Plan VQO standards sooner than Alternatives II-IV, but it would still take decades.**

TABLE S-3 (Continued)
Summary Comparison of Impacts[1]

ENVIRONMENTAL ISSUE	PROJECT ALTERNATIVES				
	I (No Action)	II (Proposed Rock Creek Project)	III (Project With Mitigations)	IV (Modified Project With Mitigations)	V (Paste Facility & Alternative Water Treatment)
Wilderness	Current wilderness experience remains unaffected.	**The wilderness air intake ventilation adit would be highly visible and audible to recreationists using the CMW within 2,500 feet of the adit. The adit would significantly affect the wilderness experience of those users (see Noise above).**	Placing the air intake ventilation adit in a more vertical slope could increase its visibility, but would reduce the area of disturbance around the adit. Additional reclamation requirements would reduce the visual impacts of the adit after mine closure. Sound mitigations would reduce the noise-related impacts to humans and goats to a 100-foot radius around the adit.	Same as Alternative III. Same as Alternative III.	Same as Alternative III. Same as Alternative III.
Forest Plan *	No changes needed	Total acres reallocated to: MA 31, Mining - 143 MA 23, Utilities - 46 MA 11, Big game winter range - 12 **Total acres changed = 201**	Total acres reallocated to: MA 31, Mining - 135 MA 23, Utilities - 51 MA 11, Big game winter range - 11 **Total acres changed = 197**	Total acres reallocated to: MA 31, Mining - 110 MA 23, Utilities - 38 MA 11, Big game winter range - 10 **Total acres changed = 156**	Total acres reallocated to: MA 31, Mining - 108 MA 23, Utilities - 39 MA 11, Big game winter range - 0 **Total acres changed = 147**

Notes:

* Forest Plan = Not an environmental issue but a KNF management issue, these management area reallocations would occur only on project approval. Environmental impacts are addressed in specific resource sections.

[1] All significant or potentially significant impacts are in **bold text**. For more detail, see Chapter 4.